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CEYLON FERNS:

JOHN DONNELL SMITH
REPRINT COLLECTION

AND THEIR ALLIES,

WITH

FAMILIAR NOTES ON EACH SPECIES

BY

WILLIAM FERGUSON, F. L. S.

(AUTHOR OF A "DESCRIPTION OF THE PALMYRA PALM," (BORASSUS FLABELLIFOMIS) OF "THE SCRIPTURE BOTANY OF CEYLON"; OF NOTES ON CEYLON BOTANY IN SIR J. EMERSON TENNENT'S "HISTORY OF CEYLON;" OF A "DESCRIPTIVE LIST OF THE TIMBER TREES OF CEYLON," &C.)

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The M.S. of the Ferns proper of this list was finished on the 15th October, 1873, and was printed off as far as No. 153 before May 1875.—From a Supplement by Col. Beddome to his Ferns of Southern India and British India published in 1876, I have inserted some additional numbers discovered in Ceylon, and made a few corrections. In a paper on the Ferns of Northern India, by Mr. C. B. Clarke, published in vol. 1, 2nd series, of the Linnean Society's transactions, in 1880, he has fully discussed several of those about which I had previously written, confirming my views in many instances. From this paper and a check list of Ceylon ferns, by George Wall, Esq., I now add the following names which differ from those in my list. Mr. Clarke gives some ferns as Ceylon ones which I do not believe have been found in the island. Mr. Clarke's elaborate paper, which is intended as a supplement to the Synopsis Filicum of Hooker and Baker, proves what a vexed question the proper names of ferns has become in many cases, and also that there is no danger of the subject being exhausted. In transferring this list of altered names, I do not mean that all Mr. Clarke's alterations should be adopted as correct.

1. Gleichenia liniaris, C. B. Clarke.
9. Trichomanes digitatum, Sw.
10. Hymenophyllum tenellum, Kuhn.
12. Is given as var. H. Blumeauum of No. 10_a.
14. Hymenophyllum Neesii, Hk.
15. Trichomanes Wallii, Thwaites, not described nor figured that I am aware of. I separated this fern from a mass of Trichomanes muscoides, Sw., found by me in March 1870 at the site of the Labugam Kraal, with the following note on it:—Fronds cordate without marginal rim, and spurious venules, not T. muscoides. Trichomanes Motleyi, V. D. B. on which Mr. Wall, who subsequently found this fern elsewhere, remarked:—Different from T. Motleyi in having setaceous margin, and the fruit not in a sinus.
18. Trichomanes pyxidiferum, Linn.
21. Trichomanes bipunctata, Poir.
26. Davallia (Leucostegia) chærophylla, Wall.
28. Davallia (odontoloma) Schizophylla, Baker, is a cut form of 41. Lindsaya, flabellulata, Dry.
29. Lindsaya repens, Bed.
34 & 37. Become one.=Davallia (Microlepia) polypodioides, Don.
38. Davallia (Microlepia) flaccida, R. Br.
39. Davallia (Stenoloma) Chinensis, Sw.
41. Includes 28 as above.
44. Lindsaya (synaphlebium) lobata, Poir.
45. Lindsaya (Schyzoloma) ensifolia, Sw.
61. Pteris ensiformis, Burm.
63. Pteris longipes, Don.
68. Pteris (Litobrochia) marginata, Bory.
78. Asplenium lunulatum, Sw.
84. Asplenium unilaterale, Lamk.
86. Asplenium laciniatum, Don.
101. Asplenium (Diplazium) Japonicum, Thunb.

101/1 } Asplenium (Dipl.) Japonicum, var. Schkuhrii Thw.
104 }
108. Allantodia Javanica, Bedd.
109. Actinopteris dichotoma, Bedd.
114 & 114/1 Aspidium (Polystichum) aristatum, Sw.
123. Nephrodium (Lastrea) gracilescens, Hook.
128. Nephrodium (Lastrea) crenatum, C. B. Clarke.
130. Nephrodium (Lastrea) dissecta, Desv.
131. Nephrodium (Lastrea) rhodolepis, C. B. Clarke.
144. Nephrodium (Lastrea) tenericaule, Hook.
143 { Nephrodium (Lastrea) parasiticum. C. B. Clarke.
{ also Nephrodium (Lastrea) procurrens. Hk.
148. Nephrodium (Sagenia) reductum. Baker.
156. Oleandra neriiformis, Cav.
159. Polypodium (Phegopteris) rugulosum, Labill.
171. Polypodium miuutum, Bl.
180. Polypodium (Phymatodes) puctatum, Sw.
182. Var. oxyloba, of Polypodium, (Phymatodes) hastatum, Thunb.
189. Gymnogramme fraxinea, Bedd.
202. Hemionitis arifolia, Bedd.
206. Acrostichum (stenoclœna) palustre, Bedd.

TESTIMONIALS.

(From the Preface to Thwaites' and Hooker's "Enumeratio Plantarum Zeylaniæ," p. vii.)

"To the Rev. S. O. Glenie, F. L. S., Episcopal Colonial Chaplain at Trincomalie, and to Mr. W. Ferguson, F. L. S., Civil Engineer, I am under great obligations for frequent valuable communications, and for specimens of plants from their respective places of residence."

(From the Introduction to Sir Emerson Tennent's "History of Ceylon.")

"Although a feature so characteristic as that of its *Vegetation* could not possibly be omitted in a work professing to give an account of Ceylon, I had neither the space nor the qualifications necessary to produce a systematic sketch of the Botany of the Island. I could only attempt to describe it as it exhibits itself to an unscientific spectator; and the notices that I have given are confined to such of the more remarkable plants as cannot fail to arrest the attention of a stranger. In illustration of these, I have had the advantage of copious communications from William Ferguson, Esq., a gentleman attached to the Survey Department of the Civil Service in Ceylon, whose opportunities for observation in all parts of the Island have enabled him to cultivate with signal success his taste for botanical pursuits,"

(Copy of a Letter from Sir J. E. Tennent.)

"London, Board of Trade,
"January 19th, 1857.

"My Dear Sir,

"I cannot put in words the sense of obligation which I feel for the trouble you have taken, and the value you have imparted to my *MS.* by your notes and emendations. I have just risen from their perusal and I am struck with the power of observation they display and quiet sound sense by which they are characterized. For my own part, in writing this chapter, I felt at every step the uneasiness of being out of my depth—of Botany I know almost nothing —I was always discouraged by the vastness of the field and the disproportion of man's life, to the period necessary to master the facts of such a science—and so I turned away from it in despair. All I could do therefore in Ceylon was to wonder at the marvels and beauties of its *vegetation*—but to sketch its *botany*. was an attempt beyond my daring. Your care has now satisfied me that what I venture to print is authentic and your additions have given an interest to the whole that it wanted sadly before.

"Again accept the assurance of my sincere thanks.

"In the course of eight or ten days I shall address myself to re-write the chapter; and then I will ask your permission, to send it to you a second time in order that you may see that I have done it correctly.

"Ever gratefully yours,
"(Signed) J. Em. TENNENT."

"Wm. Ferguson, Esq.

ABBREVIATIONS.

☞ The following is a list of abbreviations of some of the authorities for the names of Ceylon Ferns:—

A. Br.—A. Braun,
Bernh.—Bernhardi ;
Bl.—Blume ;
Brong.—Brongnihart ;
Desv.—Desvaux ;
Dry.—Dryander.
Forst.—Forster.
Hk.—Hooker.
Hk. and Gr.—Hooker and Greville.
Kaulf.—Kaulfus.
Kze.—Kunze.
Lab.—Labillardiere.
Lam.—Lamarck.
Linn.—Linneus.
Mett.—Mettenius.
R. Br.—Robert Brown.
Rich.—Richard.
Schlecht.—Schlechtendahl.
Spr.—Sprenghel.
Sw.—Swartz.
Thunb.—Thunberg.
Thw.—Thwaites.
Wall.—Wallich.
Willd.—Willdenow
V. D. B.—Van Den Bosh.

The letters "C. P." and "l. c." in the following pages, it must be noted, stand for "Ceylon Plants" and "in loco citato" (that is, in the place cited) respectively.

List of Abbreviations of Words of Frequent Occurrence in the "Synopsis Filicum."

Botanical Terms.

Caud.=caudex, from which arises the frond or stipes.
St.=stipes, or stipites, which support the frond.
Fr.=frond, or fronds.
Pinnl.=pinnule, or pinnules.
Invol.=involucre, by many botannists called indusium.
Recept.=receptacle, that which bears the sori or capsules ; prominent in most *Cyatheæ* ; elongated and columnar, or even bristle-shaped, in *Hymenophyllum* and *Trichomanes*.
Caps.=capsule, or capsules.
Segm.=segment, segments, or lobes ; often used indifferently ; but a segment generally indicates a deeper or more elongated lobe.
Prim.=primary, or first division of a compoundly pinnate or pinnatifid frond ; thus prim. div., or prim. pinna or pinnl.
Second.=secondary ; the second principal division, or pinna, of a frond.

Measures of Length.

Ft.=foot, or feet.
In.=inch, or inches.
lin.=line, 1-12th of an inch.
l.=long ; thus, 1 in. l., 1 ft. l.
w. br.=wide or broad ; thus, 1 line w. or 1 in. br.

INTRODUCTION.

The following list of Ceylon Ferns &c., contains those only known to be indigenous to the Island, and therefore does not include several species given in the "*Synopsis Filicum*" as natives of Ceylon, because these have not hitherto been found by the Director of the Royal Gardens at Peradeniya, nor by other Botanists who have made extensive collections of Ferns in the Island; but a few, believed to be well marked species, though included as synonyms of others or ignored, in the "*Synopsis Filicum*,"—such as Hymenophyllum Blumeanum, Spr., and Nephrodium (Sagenia) Thwaitesii, Beddome,—are retained in this list as distinct species.

The arrangement of the Genera, and the Nomenclature adopted in the "*Synopsis Filicum*," are widely different from those in Thwaites' "*Enumeratio Plantarum Zeylanicæ*;" but believing that the former is at present the best single work on all known Ferns, I have adopted its arrangement and nomenclature.

The means and materials at my disposal for preparing this list have been so ample, that I have been enabled, I believe, to identify all the Ferns in my own collection which correspond with the names here given, with very few exceptions, if any. These materials consist of the list of Ferns &c., in "*Enumeratio Plantarum Zeylanicæ*"; reference to a very full set of Ceylon Ferns, named, and their C. P. numbers added to them, by the Director of the Royal Gardens, Peradeniya; Major Beddome's "*Ferns of Southern India and Ceylon*," and the "*Ferns of British India*," the "*Synopsis Filicum*," already referred to, and several other works specially on Ferns. I have also had the advantage of receiving small collections of dried Ferns from L. A. Bernays, Esq., F. L. S. Hon. Secretary Acclimatization Society &c., Queensland; Lady Barkly, Mauritius; from the Cape of Good Hope, and a few from St. Helena, and Scotland. Major Beddome's two works on Indian and Ceylon Ferns contain lithographed figures of nearly all Ferns hitherto found in Ceylon, and they are generally so characteristic and well done, that in most cases I had little trouble in identifying the Ferns in my collection with their aid. I have also had the advantage of receiving a few named and numbered specimens of Ceylon Ferns from the Director of the Royal Gardens at Peradenia, and from T. W. N. Beckett, Esq., F. L. S., for my private use. From Major Hutchison I have received specimens of several rare Ceylon Ferns, and added many to my collection in a trip made to Hewissa, in the direction of the Haycock some months ago in company with this gentleman.—To Messrs. J. C. Elliott, J. Catto, Wm. Cotton, R. Porter, E. Heelis, J. Bagra, J. D. Young, Arthur Thomas, and several other friends I am much indebted for specimens of Ferns from various parts of the island, and to Mr. A. H. Thomas of Mattakelle, Dimboola, I am most particularly indebted for very ample collections of Ferns sent to me from the Kallibokka valley and elsewhere. My trips in company with Mr. Thomas to the Wattakelle, and other ranges in this valley, up the Raxawa mountain, in Dolosbagie, in Dimboola, and from thence to Neura

Elliya and Hackgalla, and back, his perseverance in collecting, his daring in climbing rocks and trees in search of Ferns, his assistance in drying them, and the liberal supply of paper given to me on more than one occasion when my own supply was exhausted, are favours which I cannot easily forget. To the kindness of Mr. G. W. Rudd in placing his beautifully-situated house at Mausakelle at my disposal during periods of 1867 and 1869, I am much indebted for the opportunities I thus had of collecting Ferns in so favorable a district. To Mr. George Wall, an indefatigable collector of Ferns, I am indebted for some corrections in a more ample list of Ceylon Ferns made for my own use some time ago, and for a copy of a list prepared by him from the "*Synopsis Filicum.*"

Having myself collected a large proportion of the Ferns in this list, the temptation to add descriptions is very great; but as it is intended to be a mere list of *generic* and *specific* names, with the addition of familiar notes on their places of growth, and such other hints as may prove useful to collectors or growers of them,—ultimately to be printed so as to form convenient Labels for those making collections of Ceylon Ferns,—only one name for each Fern with the authority for it, is given. In order however, to make it as useful as possible, I shall quote the *numbers* of the plates of Ferns in Major Beddome's two works already referred to, but without quoting the names there given which often differ from those in this list. To the plates in Beddome's "Ferns of Southern India and Ceylon," I shall refer thus,—"Bed. I. t. 10," &c., and to those in Beddome's "Ferns of British India" I shall refer thus,—"Bed. II. t. 20," &c.. which contractions mean, "Beddome vol. 1. table 10" &c. and "Beddome vol. 2. table 20" &c., respectively. The favorable allusions already made by me to these works of Major Beddome, will enable me freely to remark on the plates when I do not consider them characteristic of the normal forms &c., of our Ceylon Ferns, without the fear of being charged with adverse criticism. I may here mention that the first work contains 271 plates of Ferns with letter-press descriptions, and the second work, 345 plates with descriptions and a general index to both volumes. The cost of the two works has been advertised at about £14, but I believe they are nearly out of print.

Before this list is finally printed, I hope to have the corrections of the Director of the Royal Gardens Peradeniya, and of T. W. N. Beckett, Esq. F. L. S., Dunbar estate, Dickoya, admitted to be "*the best authority*" in the island on *Ceylon Ferns.*

Of the order Filices, and Sub orders *Osmundaceæ, Schizeaceæ, Marattiaceæ,* and *Ophioglassaceæ,* there are in Ceylon of well-established species, (that is of true Ferns) no less than 225

Of *Lycopodiaceæ*	14
Of *Marsileaceæ*	3
Of *Equisetaceæ*	1
Making a total (of Ferns and their Allies) of at least...	243

Several of these are very common over large portions of the island, but others are so rare that perhaps only Mr. Beckett and Mr. Thwaites have hitherto been able to find them.

The number of distinct species of Ferns enumerated in the "*Synopsis Filicum*" is about 2,235, so that in Ceylon our 225 species represent nearly one-tenth of those found on the surface of our globe, whilst Britain has only about 44 Species of Ferns, or about 1-5th of the number we have in Ceylon, or about 1-50th of all the Ferns hitherto discovered.

A collection of specimens of about 100 to 150 species of Ceylon Ferns may seem a small affair when made up in one packet, but I think I may safely assert that it would take an ordinary Collector of Ferns about six years to make such a collection, and cost him an amount of trouble and expense both in journeying and in money that he could not at all calculate upon.

Numbers are added to the Ferns corresponding with those in my private Collection. It is hoped that these Nos. will be found useful for future reference.

Nos. 1 to 225 contain the true Ferns in their order, according to the "*Synopsis Filicum*"; Nos. 226 to 239 contain the *Lycopods*; and Nos. 240 to 242 the *Marsileads* according to "*Enumeratio Plantarum Zeylaniæ.*" Whilst No. 243 is certainly one species of Horsetail, which grows abundantly on the road-side below Hackgalla and elsewhere in the island.

I annex one or two examples of Descriptions and Remarks in full for some species of our Ceylon Ferns from the "Synopsis Filicum" with my own remarks respecting their places of growth in Ceylon, and other particulars which I believe would be found useful by Collectors of Ferns, growers of Ferns here, or other persons interested in the subject of Ceylon Ferns; and if sufficient subscribers to pay the cost of such a more amplified Work will send me their names, I shall undertake the immediate publication of an Account of our Ceylon Ferns on this plan, adding Explanations of the terms used in describing Ferns, with full instructions for Collecting, Drying, and Cultivating them. My present list has merely brief familiar notes added to the Botanical names.

(Examples of Fuller Description and Remarks referred to.)

"CEYLON FERNS.

"62.—Pteris quadriaurita, Retz; Synopsis Filicum, p. 158, No. 22. st. 1-2 ft. l., strong, erect, naked or slightly scabrous, straw-coloured or brownish; fr. 6 in. to 2 or 3 ft. l., 4 in. to 1 ft. or more br., with a terminal central pinna cut down nearly to the rachis into numerous close parallel linear-oblong lobes ½-1 in. l., 2-3 lin. br, the barren ones entire or slightly serrated, and below this several similar pinnœ on both sides, which are 6-12 in. or more l., 1-2 in. br,, the lowest 1-2 in. apart at the base, usually again compound, with one or two similar but smaller pinnl. branching from them at the base on the lower side; texture subcoriacenus; rachis and both surfaces naked; veins conspicuous, usually once forked, 1 lin. to 1-8th in. apart at

the base; sori often continuous along the whole margin of the segments.—Hk. Sp. 2. p. 179. t. 134. B.

Hab. All round the world within the Tropics, and a little beyond them. West Tropical Africa—Angola, Natal, Zambesi Land, Madagascar. Hindostan (ascending in the Himalayas to 11,000 ft.), S. China and Japan southward to Ceylon and the Malayan and Polynesian Islands and Rockingham Bay in Trop. Anstralia. America, from Cuba and Mexico southward to Brazil.—Varies, much, especially in size. P. asperula, J. Smith, is a form with the rachises and costæ furnished with slender spines; P. subpinnata, Wallich and Agardh, an Indian form with fewer pinnæ than usual; P. Argyræa, Moore, a form with a more or less distinctly marked band of white down the centre of the frond; P. tricolor, Linden, the same, with a tinge of red added (see Bot Mag. t. 5,183): and I cannot distinguish by any clear character the West-Indian P. Swartziana, Agardh, and P, Felosma, J. Smith; the Brazilian P. Sulcata, Link; the Malayan P, Pyrophylla, Blume, and P. Deltea, Agardh, and the South-African P. catoptera, Kunze. All our specimens of the Polynesian plant have dark-brown naked stipes and rachis. Mr. Thwaites sends from Ceylon a series of remarkable abnormal forms passing down gradually into a plant with narrow linear pinnæ, the lowest with only two smaller similar pinnules on the lower side. Down to No. 28 the species are closely allied to this and one another.

Thwaites' "Enumeration of Ceylon Plants," p. 386.

8. P. quadriaurita, Retz. (Hook. l. c. p. 179, t. 134, B, cum syn.)—C. P. 1330 (1129).—Et forma ludens; pinnulis plus minus irregularibus, aliis elongatis, aliis abbreviatis vel abortivis.—C. P. 1351, 3060 (1133).

Hab. Very abundant.

Thwaites, l. c., p. 438.

386. "Pteris quadriaurita, Retz." Post "abortivis" insere: P. Otaria, Beddome, Ferns of South. Ind. t, xli. An hybrida inter P. quadriauritam, Retz., et P. crenatam, Sw.?

Thwaites, l. c., p. 387.

d. Campteria.

10. P. biaurita, Linn. (Hook. l. c. p. 203, cum syn.)—P. Nemoralis, Willd.; Hook. l. c., p. 202, cum syn.—C. P. 1048 (1128, 1130, 1240, 1241).

Hab. Very common in the Central Province.

Although specimens occur which appear intermediate between this plant and P. quadriaurita, I believe the two are specifically distinct. Very young plants of each, growing side by side under exactly similar conditions, exhibit respectively, in a marked degree, the characteristic venation of the mature plants.

This is perhaps one of the most common, most abundant, and most variable of our Ceylon Ferns. It grows from the coast up to several thousand feet elevation, and varies in size, texture, and cutting according to soil, climate and other circumstances. In collections of Ferns made by persons who do not take these facts into consideration, and who collect without reference to the age or fruitfulness of their specimens, there are sure to be several specimens of this Fern under the conviction that each specimen represents a different Fern.

What I consider the normal form of this Fern is pretty well figured under Pteris quadriaurita, Retz. by Beddome, "Ferns, I. t 31," only that when found in perfection the terminal pinna and all the others have *long lanceolate* points to them.

Pteris Otaria, R. H. B. (Beddome), I. t. 40.
" " ? var. (Beddome), I. t. 219.
" heteromorpha, II. t. 89.

are simply depauporised forms of this species, and I believe I

could produce fronds from one plant grown by myself, or near Colombo which would be good representatives of these three plates.—Pteris quadriaurita var. Setigera, Hooker, Beddome II t. 202, shown to have small pinnæ on the lower side of the bases of the other pinnæ is no doubt to be found in Ceylon, but I have not noted this particular form.

Pteris Semipinnata, Linn, Bed. I. t. 34. is no doubt a good figure of one of our Ceylon forms of P. quadriaurita, and though P. Semipinnata is described in the "Syn. Fil." as a distinct species, I do not believe that it exists as such.—In "Enumeratio Plantarum Zeylanicœ," where this fern is included on the faith of specimens in the Hookerian Herbarium, collected in Ceylon by the late General Walker, Thwaites makes the following remarks :—"I have never seen the typical *P. Semipinnata* in the island; some of the aberrant forms of *P. quadriaurita* would seem to make an approach to it." When engaged in 1857 in making a careful examination of Paul Hermann's Herbarium, (formed in Ceylon in 1660-7 and now in a good state of preservation in the British Museum, in four folio volumes, and one volume of drawings,) I had the use of a copy of the "Flora Zeylanica" of Linneus, with references on its margin made by Dryander, to the names in the first edition of the "Species Plantarum" of Linneus, and to the plants and figures in Hermann's collection, and for the Pteris semipinnata, Linn. Dryander referred to the Fern rather fully described in the "Flora Zeylanica" No. 42, p. 200—1, and to specimens of it in Herm. Herb. vol, 4. p. 16 and fol. 3, p. 38 ; but I regret to say that I find no remark made by myself in addition to the *MS.* information above given. That these and Walker's specimens however are forms of the most variable Pteris quadriaurita, I have no doubt.—On the road-side between the old Kandy Road and the Kalany Temple, any one interested in the subject can collect nearly every form of this Fern from the large regularly pinnated one to that which has almost simple long lanceolate pinnæ, some speciimens of which at first sight are not unlike *Pteris cretica.*

Notwithstanding the foregoing opinion of the Director of the Peradeniya gardens about the Pteris (Campteria) biaurita, and the fact that it is put into a different section from the Pteris quadriaurita, I feel fully convinced that it is a mere form of this latter Fern for the following reasons. Several plants of the Pteris (Campteria) biaurita which I planted amongst other ferns in Colombo, and notably some very large fine specimens of this form from the old Fort ditch round the Hangwelle Rest-house, have gradually lost the Campteroid arches in the veining, and have nearly all gone off to the common veining of the Pteris quadriaurita ; several of the fronds, however having some of the arched veins between their pinnules on a few of the plants.

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40. P. (Pæsia) *aquilina*, L.; *rhizome* stout, wide-creeping, subterraneous; *st.* 1 ft. or more l., strong, erect, naked, straw-coloured or pale-chesnut; *fr.* 2-4 ft. or more l., 12-24 in. br., subdeltoid in general outline, only the uppermost *pinnœ* simple, those next in order lanceolate, cut down nearly or quite to the rachis into short triangular or linear *pinnl.*, the lowest long-stalked, 1 ft. or more l., with ample lanceolate pinnl., which are cut down to the rachis into numerous lanceolate *segm.*, which are again fully pinnate; largest entire ult. divisions 1 in. l. 2 lin. br.; *texture* subcoriaceous; *rachis* and both surfaces naked or pubescent the *veins* close, conspicuous, often twice forked, involucre double or the inner one obsolete.—*b*, P. *caudata*, L. ; *pinnl.* sometimes linear and entire or with less crowded *segm.* than in *a*, and the terminal lobe linear entire, 1-2 in. l—*c.*, *P.*

esculenta, Forst.; ult. divisions narrower and not contiguous, suddenly decurrent at the base, so that the bases are connected by a narrow lobe.—*Hk Sp.* 2. *p* 196. P. arachnoidea, *Kaulf.*

Hab. All round the world both within the Tropics and in the North and South Temperate Zones, unless it be absent from South Temperate America from which there are no specimens in the Herbarium. In Lapland it just passes within the Arctic circle, ascending in Scotland to 2,000 ft., in the Cameroon Mountains to 7,000 ft,, in Abyssinia to 8,000 or 9,000 ft., in the Himalayas to about 8000 ft. *c* inhabits principally New Zealand, Australia, the Polynesian Islands, and Tropical South America.—Dr. Spruce has seen it in the Andes 14 ft. in height.

I may extract what I have said about this Fern in a paragraph contributed to the "*Ceylon Observer,*" with reference to its use as an article of Manure for Coffee :—

"The following extract from Mr. Donaldon's "British Agriculture" refers to one of our most abundant ferns of the interior, which scarcely differs as a variety from the common bracken of Scotland, several times alluded to in the "Lady of the Lake." It is so abundant on some of the patnas and other open ground near some of the Coffee Estates in the interior, and indeed in other places as a weed in the Coffee, that the hints here given for killing it, and converting it into a good manure may prove of use to several of our readers. When speaking to a gentleman in Dolosbagie about the means of killing this Fern he informed us that the villagers gravely told him the best way to do so was by thrashing it with switches—just as good a way as any other, because the plant ultimately dies like any other, if its fronds are thrashed to death, or cut off. The creeping roots die in this case for want of their lungs: but we believe the best way after all to get rid of it, if once it gets into a Coffee Estate, is to dig up the creeping roots (rhizomes) and expose them on the surface or have them removed. A few cuttings of the young fronds close to the ground would no doubt also soon kill this Fern.

"Fern,"—*Farn-kraut,* German ;—*fearn,* Saxon ;—*filices,* Latin ;—is a plant of the cryptogamous class, and though the kind is numerous, only one vegetable comes under the notice of agriculture, the "*pteris aquilina*" of botany, or the common brake. It grows on soils of good quality, and is very generally diffused over heaths and uncultivated grounds. The roots spread horizontally and go deeply into the ground, and are often difficult of extirpation—frequent mowing of the young plants, and ploughing and dunging have been recommended, and above all the pouring of urine upon them—sheep folded on fern ground will banish them by means of the dung and urine, Fern has a salt, mucilaginous taste, and is used for thatch, for heating ovens, and mixing with bread, and for being brewed into ale. It is very astringent, and used in preparing kid and chamois leather. The ashes of ferns afford a large quantity of salt, about one-ninth of their weight, chiefly the sulphate and sub-carbonate of potash. One thousand parts of the plant cut in August, and thoroughly dried, afforded 36·46 of ashes, which yielded by lixiviation 4·5 of salt. 1000 parts of fern gave 116 lbs. of saline matter, and 100 parts gave 3·224 of earths, 4·00781 of ashes, and 0·6259 of potash: 10000 parts contain 62 of potash. Ferns are dried for being used as litter for cattle, and must be laid in the bottoms of the yards, and in very moist places, as they remain long unchanged. The organization must be completely saturated. The ashes are a good top dressing. The plants must be cut while green, as the alkali escapes from the withered plant by every shower that falls. Where ferns abound, a good litter may be got from them, and the dried plants may be cut into lengths by the straw-cutting machines, which will much facilitate the reduction of the tough fibrous texture."

ORDER *FILICES*—FERNS.

SUB-ORD. I. GLEICHENIACEÆ, Br.

1. Gleichenia (Mertensia) dichotoma, Willd.

Bed. 1. t. 74.—This is the Kœkilla of the Singhalese, and which grows in such abundance in the swampy ground in the Cinnamon Gardens and elsewhere, near Colombo, and choking nearly every thing else within its reach. It is very common all over the Island in moist places, and is often seen climbing up amongst trees and jungle to a height of 10 to 15 feet. In the Cinnamon Gardens it is as common as the Bracken, Pteris aquilina, is in some parts of the Kandyan country.

SUB-ORD. II. POLYPODIACEÆ.

TRIBE 1, CYATHEÆ.

2. Cyathea sinuata, Hk. and Gr.

Bed. 1, t. 259.—This is a small handsome tree fern, found on the banks of streams near Hewissa and in the Singhe Raja Forest. It was found by Moon many years ago, and called by him Cyathea Simplicifolia. It has a caudex about ½ to ¾ inches in diameter, and from 6 inches to 3–4 feet high, with the fronds in a tuft at the top.

3. Cyathea Hookeri, Thw.

Bed. 1. t. 260.—Found also on the banks of streams at Hewissa, and in the Singhe Raja Forest, but not so plentifully as C. sinuata, and very seldom found in fruit. Habit: the same as that of C. sinuata, but the lower portion of the fronds are pinnatified, and look so like plants of *Nephroelpis exaltata*, that at first they are liable to be mistaken for this latter Fern, and passed over.

4. Hemitelia (Amphicosmia) Walkeræ, Hk.

Bed. 1. t. 261.—This is one of the most common tree Ferns of the moist Forests of the Kandyan coutntry, and grows on a smaller scale in Forests about 20 to 30 miles from Colombo. It has very large fronds, and its caudex is the one generally used for making walking-sticks of it.

5. Alsophila crinita, Hk.

Bed. 1. t. 50.—The next species of this genus has "*gigantea*" as one of its specific names, indicating that it is a gigantic or large tree fern, but I believe this species is the tallest of our Ceylon Tree Ferns. It is common on the Rambodde Pass, and in the Forests between Neura Eliya and Hackgalla, but the finest specimens I have seen in the island were on the side of Raxawa, facing the Coffee Estate of that name.

In ascending that mountain in company with my friend, Mr. A. H. Thomas we saw a group of what was supposed by us to be some of our wild Palm trees and which I pronounced to be the Kattu-kittul (Oncosperma fasciculata, Thw.) but which on coming up to them, turned out to be a grove of this Fern, and I believe the stems of some of them were from 20 to 25 feet high, and 4 to 5 inches in diameter. We selected one growing in vegetable mould in the middle of a stream, from which to procure specimens, and got a cooly to climb up it, warning him before hand that the tree would likely topple over when he got up some distance; imagine, therefore, our surprise to find that the tree did not even sway with his weight on it, and he had the greatest difficulty to tear a

couple of fronds from it, hanging on them with all his weight. This species is easily distinguished from the next one by its size, and the wooliness of the underside of its fronds.

6. Alsophila glabra, Hk.

Bed. 1. t. 60. The fronds of this fern grow to a very large size on the banks of streams in the Kallibokka Valley, and on the Rambodde Pass, but its caudex is generally so short that it scarcely deserves the name of tree-fern, except from the large head of fronds it displays. It is easily distinguished from No. 5. by its smooth thin fronds. Mr. Lawton has photographed some characteristic specimens of this fern.

7. Diacalpe aspidioides, Bl.

Bed. 1. t. 257. This was at one time such a rare fern in Ceylon, that it was found only at the Black Pool, at Newera Ellia, by Dr. Bradford, but I have received specimens of it from Mr. John Dent Young, of the Public Works Department from Doragallatenna, in the region of Adam's Peak; small ones from Scalpa, in Dimboola, and last year Major Hutchison and Mr. G. Wall came upon lots of it near the Kurundu Oya, in the Elephant Plains. Since writing the above, I have received the following note amongst others from Major Hutchison:—"I have found this in small quantity at the Ladies' Waterfall, Newera Ellia (above the Black Pool), and on Horton Plains, and in great abundance on the Kurunda Oya where the bridle road from Maturatta to the Elephant Plains crosses the river." It is not at first sight unlike No. 8. in general shape and appearance.

Tribe 2, Dicksonieæ.

8. Dicksonia scabra, Wall.

Bed. 1. t. 258. This is the only fern in Ceylon of the tribe to which it belongs. It is found on the sides of the bridle road between Dimboola and Newera Ellia, and very abundantly in the Newera Ellia Plains. It is a handsome fern of a deltoid shape as one of its names implies. It is a good deal like No. 7 in general appearance.

Tribe 3, Hymenophylleæ.

9. Hymenophyllum corticola, Hk.

Bed. 1. t. 264. This tiny film fern is peculiar to Ceylon, and must I think be a rare one, as I found it only once growing on the bark of a single tree. It has narrow divisions with the fruit at their points, and turns dark and brittle when dry. The following are facts connected with the discovery of this fern by me. When riding at a canter, following Mr. A. H. Thomas, through the tract of forest that separated Madulkelly Estate in Kallibokka, from Matala, in 1859, I got a passing glimpse of this fern, and called out "I have just seen a fern new to me." The reply was "stop and collect it, as you may not find it again." "Go on, I know I can find it, I've taken its bearings," and sure enough we did find it on our return. The tree on which it grew was on the right hand side of the bridle road not far from the last stream crossed before leaving the forest on the Matella side. It is found also in Ambegamoa.

10. Hymenophyllum emersum, Baker.

Bed. 1. t. 267. This species is founded on Thwaites C. P. 3360 being one of the numbers for H. polyanthos, Sw. and which Vanden Bosch called H. macroglossum. On a Mauritius specimen of this Fern received from Lady Barkly, she has written, "Mr. Baker has since decided on calling it H. tenellum." But in Don's Prodromus Floræ Nepalensis p. 12, there is an H. tenellum fully described, and in a complete list of the Ferns given by

Mr. Baker in the first part of the 26th vol. of the Trans. Lin. Society, neither H. emersum nor H. tenellum get a place, so that I do not know whether Mr. Baker still considers it a distinct species or not. Lady Barkly's specimen differs considerably from Beddome's figure above quoted, but agrees well with the description of H. emersum in addenda, p. 451 of Syn. Fil.

10 *a*. Hymenophyllum polyanthos, Sw.

Bed. 2 t. 280 and 306. In my list I left out this name under the impression that we have no Ceylon fern to represent it distinct from No. 10, for which Beddome quotes C. P. 1279 and 1395, thus adding to the confusion, as the first number ought to be C. P. 3279 and the other (C. P. 1395) is for No. 13, H. Javanicum. I have not seen the C. P. 3279, but insert this name at the suggestion of Major Hutchison, who has looked over my list. I fear that it is not distinct from H. Emersum, and that if the latter name was dropped, and this one was substituted it would be a better arrangement.

11. Hymenophyllum exsertum, Wall.

Bed. 1. t. 9. This is one of the most common and most abundant of the film Ferns, covering the trunks of trees, and damp rocks in Kallibokka, the Knuckles, and indeed all the damp forests of the Kandyan country. It is not likely to be confounded with any of the other film Ferns growing in the island. Like most of them, it turns a dark brown colour when dry. The collector of these Ferns should be prepared with paper and boards for putting them into, fresh from their places of growth, and great pains should be taken in the selection of specimens, and in the drying of them as they are liable to rot if left any time in damp papers.

12. Hymenophyllum Blumeanum, Spr.

Bed 1 t. 266. This fern is included as a synonym of H. polyanthos in the Syn. Fil. but as represented by C. P. 1391, it is quite distinct. I found it in great abundance on the trunks of trees and on rocks in forests and streams near Hewissa. It is a very handsome fern and can scarcely be confounded with any other Ceylon fern.

13. Hymenophyllum Javanicum, Spr.

Bed. 1. t. 207. This is also a very abundant Fern, growing on large stones and trunks of trees, in the damp forests of the interior. The larger well-grown fronds put in paper fresh, make very beautiful specimens, but when collected in masses and not well pressed, they curl up into a dark coloured mass. Wallich's name, H. *crispatum*, is a very good one for this crisp fronded Fern.

14. Hymenophyllum Tunbridgense, Smith

Bed. I. t. 265. This one, as its name implies, is a native of Tunbridge in England, and is, like H. exsertum, a very abundant Fern on the trunks of trees in the damp forests of the interior. It can be distinguished from any other of our Ceylon Film Ferns by the serrated edges of its fronds and their divisions. Major Hutchison told me that it was suspected that our fern is H. Neesii, Hk.

15. Trichomanes Motleyi, V. D. B.

Bed. 11. t. 183 (under T. Henzaiense) and Bed. 11. t. 303 fig. F. Mr. Thwaites' specimens of this Fern growing closely on the bare bark of trees, look exactly like so many scales of a fish. Some specimens found amongst an abundant supply of T. muscoides collected from stones and the trunks of trees in the stream running through the Labbugam Kraal got up for the Duke of Edinburgh, are remarkable by their broad ovate, and deeply cordate shape, and the fruit not exserted as shown in Beddome's plate. This is one of the smallest of our Ceylon Ferns.

16. Trichomanes muscoides, Sw.

Bed. 1. t. 6. and 11. t. 303 figs. D. and E. under T. Nielgherrense. This grows in dense masses at the site of the Labbugam Kraal, near Situwake, and in the forests of the Pasdum Korle. Its fronds overlap each other like the scales of fishes, and are often variously divided when growing luxuriantly. I cannot distinguish between this Fern and Lady Barkly's specimens of T. cuspidatum from Mauritius.

17. Trichomanes parvulum, Poiret.

Bed. 11. t. 179. C. P. 3991. This tiny fan-like Fern was discovered by Mr. Thwaites to be a native of Ceylon after the publication of the Enumeration of Ceylon Plants. I found it in great abundance on the face of a large stone in a stream below Maussakellie in Kallibokka in 1869. Its fronds are like miniature fans, and are so small that the point of a lady's finger would cover a whole one with great ease.

18. Trichomanes proliferum, Bl.

Bed. 1. t. 262. Not an uncommon Fern in Ambegamoa and elsewhere. On the trunk of a tree not far from Aglawatte on the path to Hewissa in 1871. It is a delicate proliferous Fern as its name implies.

19. Trichomanes intramarginale, Hk. & Gr.

Bed, 1. t. 208. This fern seems to have been lost to science until it was rediscovered by Mr. Thwaites in the Ambegamoa district. It is not unlike No. 9. in many respects, but it is larger, and the fruit and other characters distinguish between the two.

20. Trichomanes pallidum, Bl.

Bed. 1. t. 263. This fern is also found in the Ambegamoa district, and must be rather rare. It was named T. glauco-fuscum by Hooker, both names refer to its peculiar pallid hue, which distinguishes it from any other fern of this group.

21. Trichomanes Filicula, Bory.

Bed. 11. t. 283. This is a pretty common Fern growing on trunks of trees and on rocks, but most difficult to procure in a perfect state, as it seems to be eaten by insects or in a half decayed state.—I cannot distinguish any difference between this one and T. plicatum, Van Den Bosh. Bed. 11. t. 285.

22. Trichomanes rigidum, Sw.

Bed. 1. t. 8. This is a large Fern compared with any other film Fern in Ceylon, and as its name implies, is a very rigid one. It is found in abundance overhanging the banks of streams, or gullies, or growing in the low ground near rivers in the Forests below Maussakellie, in Kallibokka, above Le Vallon in Nilambe, and on the road-side from Dimboola to Newera Ellia. Our Ceylon one is so stiff and liable to curl up that I do not suppose it is possible to secure nice-looking Herbarium specimens unless they are ironed flat whilst quite fresh. A specimen from Lady Barkly from Mauritius looks quite thin and filmy compared with our Ceylon ones. The fronds of this fern should be carefully selected and immediately put under pressure in order to secure good ones.

23. Trichomanes exiguum, Beddome.

Bed. 11. t. 275. C. P. 3957 under Hymenophyllum. This tiny fern was discovered growing on rocks and trunks of trees in damp Forests of the Central Province by Mr. Beckett, and in Wynaad and Coorg by Major Beddome. It is very like specimens of T. Barklianum, Baker, from Mauritius, but differs from this latter by its branching veins, and by its two-lipped fruit.—In writing of the T. Barklianum, Baker (Journal Linnean Society vol. 9. p. 338) remarks :— " Discovered by Sir Henry Barkly, the Governor of Mauritius, and Lady Barkly,

at the Tamari cascade in that island. This species, and Hymenophyllum parvifolium described below, are probably the most diminutive of known ferns, as it would take upwards of fifty fronds of average size to cover a square inch." —I feel pretty sure however that Ceylon forms of No. 15. T. Motleyi, are about the smallest of any known fern, as I believe a square inch would cover from 100 to 200 fronds, as found growing on the bark of trees.

Tribe 4, Davallieæ.

24. Davallia (Humata) pedata, Smith.

Bed. 1. t. 12. Forms of this Fern when growing on exposed rocks, are very small, of a triangular shape, and of a beautiful golden colour when dry, but in damp sheltered places, the fronds are larger and more deeply dissected, and then they so nearly approach the next one, D. (H.) vestita, that it is very doubtful if our Ceylon Ferns are distinct species, though I have never found a form so much divided as those of C. P. 3068 for the next species.

25. Davallia (Humata) vestita, Bl.

Bed. 1. t. 253. Whilst No. 24 seems to be a common Fern in the Central Province, this one seems confined to the Bopatalawa plains, at an elevation of 5000 or 6000 feet, and it is not unlikely that the higher and damper climate where it is found, may account for the difference in its larger size and deeper cutting. It is likely that intermediate forms may prove them to be one species, and indeed specimens of No. 24 so approach No. 25 in many respects, that I doubt if they are distinct. I have not collected the typical form of No. 25.

26. Davallia (Leucostegia) pulchra, Don.

Bed. 1. t. 10. This is a very handsome Fern as its name implies. The fronds of this and the next species spring from a long creeping rhizome, and are generally found on the rotten trunks of trees or growing in vegetable mould on the surface of large stones or rocks in the Kandyan country, and in general appearance are so like each other that they are liable to be confounded. No. 26 however has smaller fronds, and larger fruit, and does not turn so dark in drying as does No. 27, but the great distinguishing marks between the two are the scales covering the creeping rhizome. In 26 they are short, broad, obtuse, and adpressed, and of a light straw colour, whilst in 27, they are of a rust colour, with long sharp points to them.

27. Davallia (Leucostegia) affinis, Hk.

Bed. 1. t. 252. A very handsome Fern with large delicate feathery fronds, deeply cut into small segments. They spring from a long creeping rhizome, and are sometimes from 2 to 3 feet in size. Found generally growing in vegetable mould on rocks or stones, and often festooning the trunks of trees to a height of 10 to 12 feet, in the damp forests of the interior. The long pointed and rust coloured scales covering the rhizome, its larger size, and its darker colour in drying distinguish this one from No. 26.

28. Davallia (Leucostegia) Trichomanoides, Hk.

Bed. 11. t. 178. This is a small delicate Fern discovered in Ceylon by Mr. Thwaites after the publication of Enum. Plant. Zeyl. It is found on the Gongalla Hill, and elsewhere in Rakwana. Amongst a few Ferns picked up by Mr. John Ferguson in passing through this district lately, I find several small specimens of this Fern. In some respects it is not unlike very small delicate specimens of No. 39, D. (Stenolema) tenuifolia.

29. Davallia (Odontoloma) repens, Desv.

Bed. 1. t. 209 and Bed. 1. t. 214 var. minor. The larger form of this Fern is found in the Singhe Raja Forest, and the smaller one was found

in Matala by the late Dr. Gardner. Mr. Thwaites in En. Pl. Zeyl. called this Fern Lindsaya repens, and quoted the synonyms for it that Baker does for the D. (O.) repens, and also for Lindsaya pectinata, of Blume, and expresses a doubt if the two Ferns be distinct. This is a rare Fern. It looks like some forms of Lindsaya (Syn.) nitens Bl., but is easily distinguished from the former by its free veining.

30. Davallia (Prosaptia) Emersoni, Hk. & Gr.

Bed. 1. t. 20. This Fern grows in dense masses on the sides of large stones, on rocks, and trunks of trees, but generally in streams or in their vicinity. Mr. Thwaites says, it is not uncommon in the forests of the Central Province, but I never found but one poor specimen on a stone in a stream below Mausakellie and Kallibokka in the Central Province. I found it in great abundance on stones in a stream near Hewissa. It grows in tufts, fronds sessile, lanceolate, pinnatified from the margin to half way down to the costa, attenuated and entire at the apex, the lobes are oblong obtuse, having from one to six sori at their apices.

This fern cannot be confounded with any other growing in Ceylon.

31. Davallia (Prosaptia) contigua, Sw.

Bed. 1. t. 19. This fern grows in abundance on the trunks of trees in streams in the forest about a mile from the Mattakellie Estate, on the road to Nuwera Eliya, often intermixed with the very common Polypodium obliquatum, and so like it in size and general appearance that the two are liable to be confounded with each other, but the Davallia can be at once distinguished from the Polypodium by its terminal, generally solitary sori, on the segments or lobules.

32. Davallia elegans, Sw.

Bed. 1. t. 19. This, when in full, fruit and in a growing state, is one of the most beautiful ferns in Ceylon, but it turns nearly black in drying. It grows on a stout creeping rhizome, densely covered with wooly fibres.

The fronds are from one to three feet long and one to one and a half in breadth, and cut up into elegant divisions. I found it on rocks at the ferry, on a large stream on the bridle-path between Madulkellie, and the Knuckles, not far from the former place in 1867, but in visiting the same place in 1869 it was not in fruit. I received a supply of it from Mr. James Grant of Vicarton, and whilst I am writing (on 20th July) I have received some splendid specimens from the same gentleman, who states that it is now in perfection. Having forgotten to include Mr. Grant's amongst the names of my contributors I beg to do so now for this and other favours in the Fern line:

"An el Grauntach an Strathspey, ach duina a' treach urumach." !

[*Anglice* :—There is no Grant in Strathspey who is not powerful and brave.]

33. Davallia bullata, Wall.

Bed. 1. t. 17. This is a rare Ceylon Fern, but has been found in Rakwane, and East Matella since the publication of the Enumeration of Ceylon Plants. It grows on a stout, creeping rhizome, densely clothed with light-brown or whitish fibrilose scales, and in some respects looks like much dwarfed specimens of Davallia elegans.

34. Davallia (Microlepia) strigosa, Sw.

Bed. 1. t. 255, C. P. 1386. I found this fine Fern growing in the edges of the forest at Kittoolamoola estate in Deltotte; in the forest in the first gullie on the path leading from Le Vallon to Deltotte; and in the belt of forest on the roadside close to Cragie Lea, in Dimboola. At No. 37, D. (Microlepia) hirta, I shall refer to the difficulty I have in distinguishing this latter number from No. 34, and especially from No. 38.

35. Davallia (Microlepia) platyphylla, Don.

Bed. 1, t. 13. I received some good specimens of this fern from Major Hutchison, who informed me that he found this one, D. hirta, and D. Thwaitesii,

(Now D. Majuscula, Lowe) on the banks of the river above the Rambodde Rest House.

This is a rare fern, and Mr. Wall says it grows to a height of 8 to 12 feet and probably dies off during part of the year.

36. Davallia (Microlepia) majuscula, Lowe.

Bed. 1. t. 254. Beddome's figure is from Ceylon specimens, which were called D. (M.) proxima, Bl. but Blume's specimens for this fern are supposed to be a form of D. hirta, and therefore the Ceylon fern was described by Baker in Syn. fil. as Davallia (Microlepia) Thwaitesii, but Mr. Lowe's name having priority of publication I suppose, is now adopted. I borrow this name from Mr. Wall's Catalogue of Ceylon Ferns.—My specimens are from Major Hutchison, found above the Rangbodde Rest House with No, 35.—Mr. Wall thinks this one, which is also a rare fern, dies off during a part of the year.

37. Davallia (Microlepia) hirta, Kaulf.

Bed. 1. t. 256. Every chapter of the Mahawansa, or great History of Ceylon, ends thus:—" This Chapter was composed equally for the delight and affliction of good men;"! but if the history of this Fern were known, it might with equal force be stated that it was first created, and next described as a distinct species, " for the annoyance and discomfiture of good Pteridologists"! A small specimen from Mr. Beckett, agrees with Beddome's figure quoted above, but neither can be clearly distinguished from forms of the next species, No. 38. I have received specimens of D. (M.) hirta, from Major Hutchison, collected from a spot above the Rambodde Rest House, and my own collection was made in the belt of Forest through which the Dimboola road passes just beyond Cragie Lea, on the right hand side where the Collector has to scramble up the face of a steep cutting, to get to a path on each side of which this Fern grows in abundance.—As far as I can judge from a considerable collection made by myself in various parts of the interior, I feel nearly convinced that No. 34 and this one gradually run into each other, 34 being the younger, and 37 the older states of this species.—For 34, Baker quotes two forms, which the late Sir W. Hooker included in No. 38, and with reference to 37 Baker remarks:— " This has the stature and habit of D. Speluncœ, (No. 38) combined with the coriaceous texture and prominent venation of D. strigosa. " But why no less than six species in the Syn. Fil. some of them very distinct and different from 34 and 37, separate these two species, I do not understand, surely those most like each other should be in close proximity in the order of description.—The following remarks by Major Beddome after the description of his figure here referred to, does not I fear lessen the difficulty in separating Nos. 34, 37, and 38:—" I have long had this Fern in my herbarium, but until I received a " specimen of it from Mr. Thwaites as an authentic spec. of *M. hirta*, I had al- " ways considered it only as a variety of *M. polypodicides*, (No. 38.) I have " lately collected on the Courtallum Hills (Tinnevelly,) what I take to be a " third variety: it is very nearly allied to the Ceylon and Malabar *M. hirta*, " but is more delicate—the secondary pinnules are narrower, the involucres are " quite glabrous and the fronds nearly so."

When trying to separate my specimens of Nos. 34, 37 and 38 I found that forms of 34 or 37 and the remarkable C. P. 1388, for No. 38 were all mixed up together in the same packets.

38. Davallia (Microlepia) Speluncæ, Baker.

Bed. 1. t. 15. This is one of the most common of our Ceylon Ferns, and a very general favorite in cultivation in Colombo. It is to be found in rich soil on road sides, and in damp shady places from the sea shore up to 3,000 to 4,000 feet elevation. The common hairy form can scarcely be confounded with any of our Ceylon Ferns. The fronds are from 3 to 6 feet in length. The C. P. 1388, an alpine form, is so different from the common one that I have mixed it up with Nos. 34 and 37, see the foregoing remarks. Baker remarks:—" This is much more tender in texture than *D. strigosa* and *hirta*, so " much so, that the pinnæ are liable to shrivel up when the plant is gathered

" in a hot country. It resembles *Dicksonia rubiginosa* considerably in general " appearance, and has a wide geographical range." I examined specimens in the British Museum which were collected in Ceylon by Hermann in 1660-7, and described by Linneus in his Flora Zeylanica.

39. Davallia (Stenoloma) tenuifolia, Sw.

Bed. 1. t. 16. This is one of the most common Ferns in the Kandyan country, generally found completely covering the deep cuttings along the various roads of the interior. It is sometimes called in Ceylon the "*Parsley leaved fern,*" and cannot be confounded with any of our other ferns. It covers the steep banks of the roads in the interior, in the same way that No. 53, Cheilanthes tenuifolia, covers similar places in the Western Province.—I have seen D. tenuifolia growing freely in pots in the shade in Colombo, but it requires great care in its cultivation.

40. Lindsaya cultrata, Sw.

Bed. 1. t. 23, and 11. t. 28. This is an abundant Fern growing on the damp banks of streams or small gullies in the more elevated parts of the Central Province.

It is plentiful in streams in the Lindoola Patnas, and in gullies in the Nuwera Eliya Plains, on the right hand side of the road to Hackgalla.

Very small simple forms of Lindsaya (Synaphlebium) nitens, may be confounded with this fern, as far as the general appearance of both is concerned, but L. cultrata has one peculiarity which distinguishes it from all our other Ceylon Ferns.—When drying it is delightfully fragrant, reminding one strongly of Woodroof, indeed I never collected this fern, or plants of the Dopatrium nudicale, also a most fragrant plant when drying, without being reminded of the fragrance of Woodroof, and consequently of the Scottish meadows and early associations connected with them. " One touch of Nature makes the whole world Kin."

In reply to a note to Mr. Thwaites attracting his attention to the fragrance of this fern, he wrote me on 12th September, 1868, as follows:—"I am sorry " I cannot congratulate you upon the discovery of a novelty as regards the odour " of *Lindsaya cultrata*, or its small form, I generally put a bit of this species " into my pocket when I meet with it, in order to enjoy its fragrance when it " begins to get a little dry."

41. Lindsaya flabellulata, Dryander.

Bed. 1. t. 216 and 24. The form described by Dryander as L. tenera C. P. 1381, and well-figured by Bed. t. 24, is a most abundant Fern in the Forests of the Kandyan country, whilst L. flabellulata C. P. 3311, is a somewhat rare fern with the pinnules of a trapezoid shape, very oblique on the under side, and larger and thicker in structure,—Beddome's figure of this latter is not good for C. P. 3311.

42. Lindsaya trapeziformis, Dry.

Bed. 1. t. 217. This is a large handsome Fern, and cannot be confounded with any other Ceylon Fern. I found it in abundance in the forest on the ridge separating Le Vallon-Estate from Deltotte, in Puakpittia Forest near the 26th mile post on the Sitawaka road, and in the Kottawa Forest, about 10 miles from Galle, and alluded to by the late Dr. Norman MacLoed in an article in *Good Words* when refering to Galle.

43. Lindsaya (Isoloma) Walkeræ, Hk.

Bed. 1. t. 215. This fern was first discovered by, and named in honour of the late Mrs. General Walker, an accomplished lady who collected and painted several of our rare Ceylon plants. The very singular, yellow-flowered creeping Rock Balsam, the Impatiens repens, Moon, and the almost leafless, Vanilla Walkeræ, Wight, are figured in Dr. Wight's works on Indian Botany, from the drawings of Mrs. Walker.—This Fern is found in swampy grassy places in the Saffragam district, and especially in such a place, about a mile on the Aglawattie side of Hewissa.—Very young specimens when growing may be confounded

with Lindsaya (Schizoloma) lanceolata, but it is otherwise quite distinct. It is also a native of Banca, to the Eastward of Sumatra.

44. Lindsaya (Synaphlebium) nitens, Bl.

Bed. 1. t. 27. This is generally a bipinnated Fern, but it is found very often of a small size, with simply pinnate fronds, when it a good deal resembles L. cultrata or one form of No. 29. Davallia (Oda.) repens.

It is a very variable and abundant fern, but is easily recognised in all its states by its netted veins. Found on the banks of streams at the side of the Labbugama Kraal, at Kottawa Forest near Galle, and common in the Central Province.

45. Lindsaya (Schizoloma) lanceolata, Lab.

Bed. 1. t. 25 and 11. t. 29. This is a common fern from the sea coast up to the Kandyan country, found in Cabook cuttings on road sides.

In good sheltered soil it grows from 18 to 20 inches in height, with several pairs of opposite pinnæ, but in dry exposed places it has generally only one pair of pinnæ, and a long terminal one, occasionally it has only a single lobe, when Bed. 11. t. 29 agrees for it. The pinnated plant looks a good deal like Pteris cretica.—I feel quite sure that the following one though figured in two places by Beddome, and described as a distinct fern in the Synopsis Filicum, is a mere form of this variable fern.

45/1. L. (Schizoloma) heterophylla, Dry.

Bed. 1. tt. 26 and 206? I found a single plant of this Fern near Lady Horton's Walk, at Kandy, but it is found in great, abundance in the Wannapottu Muckulane, at Pory, about thirteen miles from Colombo, where in the rich soil, and under the dense shade of the forest it grows to a height of 1½ to 2 feet.—I have plants from this place with every conceivable mode of cutting from the simply pinnated L. (Sch.) lanceolata above, to bipinnated, and all sorts of shapes of pinnules from reniform, deltoid, lanceolate &c., A very common mode of cutting is to have one side of a long lanceolate pinnule quite entire, and the other side from the midrib cut up into stalked lobes, but the specific name "*heterophylla*" is truly applicable to this form of it. It is quite common to find fronds of these two supposed species growing on the same plant. On none of my specimens can I find *all* the veins free like those on Bed. 1. t. 206, but on several of the smaller pinnules they are so, and I therefore conclude they are the same plant. Baker thinks it very likely that the L. (Schiz.) Fraseri, Hk. of Queensland, is a small delicate form of this plant.—It is certainly only a form of No. 45.

Tribe 6, Pterideæ.

46. Adiantum lunulatum, Burmann.

Bed. 1. t. 1. A delicate Fern, with tufted, wiry, naked, polished, dark chesnut-brown stipes, and half moon shaped alternate pinnæ. Found at one time in great abundance growing in the crevices of the old walls in a Budhist enclosure near the Maligawa Temple at Kandy, but now nearly entirely gone. Sparingly on the sides of the cuttings along the roads to the Southward of the Lake at Kandy. but in great luxuriance and abundance about seven miles from Kandy, on the Harragam road. I have received specimens about two feet in length from this place collected by Major Hutchison. It grows freely in shade in Colombo, and cannot be confounded with any other Ceylon Fern.

47. Adiantum caudatum, Linn.

Bed. 1. t. 11. and 11. tt. 17 and 19? One of our most common Ceylon Ferns, on road sides and in shaded places from the sea shore well up into the higher parts of the Kandyan country, with the fronds generally radiating from the centre, and lying flat on the ground, each frond gradually tapering to a long narrow end, which is generally terminated by a long naked wiry tail, the extreme end of which often takes root and produces young plants.

I examined several specimens of this Fern in the British Museum, collected by Hermann in Ceylon in 1660-6, Burmann's Thea. zeyl. t. 5. figure 1. is a much more characteristic one than Bed. 1. t. 2. The nearly glabrous form, A. rhizophorum, Sw. is found in abundance in the jungle at the base of the hill near the residence of the Assistant Government Agent at Kurunegalla, at Kandy, and on the Harragam Road, and differs a good deal from the common and more tomentose form. Bed. 2. t. 17 is quoted as a synonym by Baker, and he thinks that Bed. 2. t. 19 is only a form of this fern.

48. Adiantum Capillus—Veneris, Linn.

Bed. 1. t. 4. Who does not know the common Maiden Hair Fern?; and yet it is frequently confounded in Colombo, with the A. concinnum, H. B. K. a native of tropical America, and which is more commonly cultivated than our native fern, and still more beautiful as its name would indicate and also with very fine tall specimens of the A. Æthiopicum, which is so like the Maiden Hair fern that they are constantly confounded. The common Maiden Hair Fern is found growing in the mouth of the old tunnel a short distance from Kandy on the old Kurunegala road, and in great abundance and luxuriance on the banks of a rocky stream on the right hand side of the Badulla Road about two miles below Hackgalla. When collecting some in this place some years ago in company with A. H. Thomas, this gentleman found a snake, the poisonous Hypnale Nepa, if I recollect aright, wriggling through his fingers and his parcel of ferns, when he cooly caught him behind the head, and secured him.

The finest specimens of this Fern and of A. Æthiopicum, I have ever seen were those grown by Captain Bailey of the P. and O. Company, under a covered place close to Galle. Some of the fronds growing in vegetable mould and amongst rock work here hung down to a length of two to three feet. Very fine large specimens of the A. Æthiopicum fern are now not uncommon in pots in Colombo.

49. Adiantum hispidulum, Sw.

Bed. 1. t. 3. A common Fern in the forests of the interior, and on the moist banks of streams. The young smooth and thin fronds of this fern are very unlike the old mature ones, which are easily distinguished from the other species of the genus by their densely pubescent segments and racihses.

50. Andiantum flabellulatum Linn.

Bed. 1. t. 218. Found in the Ouvah district according to Thwaites, but I have never yet found it in a wild state. "The pinnules are larger and broader than those of A. hispidulum, and only the rachis is finely pubescent."—Baker.

51. Cheilanthes Mysurensis, Wall.

Bed. 1. t. 190. This lovely tufted fern is found in great abundance growing in vegetable mould on the road side, and on the surface of the rocks near the summit of Kurunegala rock. It grows freely in the shade of other ferns in Colombo. Very great care is required to secure good dried specimens of this fern, and its ally, the Ceylon Silver Fern, C. farniosa, both of which curl up over the fruit along the edges unless the specimens are put into paper at once and dried under considerable pressure. This Fern is not likely to be confounded with any other in Ceylon. In Mr. Wall's notes on his catalogue of Ceylon Ferns, he states that this fern attains a most luxurious growth on the road from Rattotta to Oodelamana with fronds eighteen inches in height.

52. Cheilanthes Thwaitesii, Kuhn.

Bed. 1. t. 189. Said to be found in the Kurunegala district and Kallupane. It is a coarser and less divided fern than C. Mysurensis, and evidently is a rare fern in Ceylon.—Baker does not give C. varians as a Ceylon fern, but under C. fragilis, Hk. he remarks,—"from the Ceylonese *C. laxa*, Moore, it differs mainly by its tomentose rachis," but Thwaites quotes the C. laxa, Moore, as a synonym of C. varians. I am indebted to Mr. Wall's catalogue for the above name for my No. 52. The following is Mr. Wall's note on it, "C. Thwaitesii, Kuhn,—Dr. Kuhn, Linnea, volume xxxiv, page 82, is of opinion that our Ceylon Species, hitherto referred to C. varians, Hk.

is in fact, distinct; and as Mr. Baker agrees in this opinion, the name is adopted in my list on their authority. My own specimens of the typical Himalayan plant do not enable me to discover any specific difference between the two. The Ceylon plant is said to have a tendency to be white farinose underneath."

53. Cheilanthes tenuifolia, Sw.

Bed. 1. t. 188. This is a lovely and most abundant little fern, confined to the warmer parts of the Island. Growing on the perpendicular sides of the cabook cuttings on the road side in Fishers' Hill, and everywhere within a few miles of Colombo, it is a small plant from two to four inches long, but along the more protected cuttings on the road between Kaduwella and Hangwella, and growing in masses of vegetable mould on the tops of the rocks on the right bank of the Kelani River below Kaduwella and elsewhere in the Western Province it attains to a length of 12 to 15 inches, and when covering the sides of cuttings in the wet season it vies in beauty with the Davallia (Sten.) tenûifolia, which covers similar places in the Kandyan country.

54. Cheilanthes (Aleuritopteris) farinosa, Kaul.

Bed. 1. t. 191. This is what is generally called our "*Silver Fern*," the only native of Ceylon which can be so called, and which must not be confonnded with the very different one commonly cultivated here, and which is a native of the West Indies, &c., the Gymnogramme (Ceropteris) calomelanos, Kaul, or species.—Our Ceylon plant is an exceedingly variable plant as regards its size, being found in full fruit from the size of 1½ inch on hard soil on banks exposed to the full blaze of the sun, to plants 2 to 3 feet in height, growing in rich vegetable mould on the surface of wet rocks in the forests of the interior; it is a common and abundant fern, but like its ally, the C. Mysurensis, very difficult to dry nicely. The collector of this fern should see that his specimens are all good before they are collected, and then put into paper *at once*, under pressure to prevent the edges curling over as they are otherwise sure to do. Were it not that the C. Argentea, Hk. Bed. 2. t. 143. is described in the Syn. Fil. as distinct from this species, I should feel inclined judging from Beddome's figure to unite them.

55. Pellœa (Cheiloplecton) geraniæfolia, Fee.

Bed. 1. t. 37. The Gerenium-leaved Fern is very common in most Coffee Estates in the Kandyan country, and cannot be confounded with any of our other Ceylon Ferns.—I found a solitary plant of this Fern near Kalani Temple, about six miles from Colombo several years ago, but have never found another in the same place nor below 2000 to 3000 feet,—It is generally such a small plant, and grows so firmly in the crevices of the rocks and stones in Coffee Estates, that it defies the vigilance of the weeders, and hence it is no uncommon plant amongst the best cultivated Coffee in the interior.—In general outline it is very like Bed. 2. t. 143., above referred to for C. argentea.

56. Pellæa (Allosorus) boivini, Hk.

Bed. 1. t. 36. This is a rather rare fern in Ceylon, I found one or two specimens of it growing in grass not far from the Trig. Station on the top of Wattakellie Hill, Mr. Beckett's famous fern ground, one or two on the top of a rock close to the Centry Box, and it is said to be found on the top of the Hantane ridge. It cannot be confounded with any other Ceylon fern.

57. Pellæa (Platyloma) falcata, Fee.

Bed. 1. t, 22. var. setosa. This is a rare fern in Ceylon. Its C. P. No. (3933.) indicates that it was found in Ceylon after the Enum. Plant. Zeyl. was published, the last C. P. No., in this work being 3859, for the Borreria tetracocca, Thw. now Fergusonia zeylanica, Hook. fil. The habitat given to me for this fern is " opposite Mr. Ziesniss's Bungalow, and Mr. Beckett's old cave House, Ratotta. Telgamma river, East Matalla—not elsewhere. This one cannot be confounded with any other Ceylon Fern.

58. Pteris longifolia, Linn.

Bed. 1. t. 33. Thwaites gives Oova and Dumbara districts as the habitat for this fern, and Major Hutchison, has given me very large specimens, 2 to 3 feet long, collected by him about a mile above Wilson's Bungalow, on banks on the road side. It cannot be confounded with any other Ceylon Fern. It is found in Tropical and warm temperate regions all round the world.

59. Pteris cretica, Linn.

Bed. 1. t. 39, Not good. Thwaites has this fern, C. P. No. 3502, from the Oova district, and gives P. Hookeriana, C. P. No. 1329. from Saffragam, as only a variety of it. Baker does not give Ceylon as a habitat for P. cretica, but states that P. pellucida, Presl; Bed. 1. t. 38, is a Ceylon fern, "but not satisfactorily distinct from P. cretica," whilst he gives Hookeriana, Agardh from about 2,000 feet near Adam's Peak as a distinct species. Thwaites's C. P. No. 3502 agrees upon the whole with European specimens of P. cretica, and is very different from Bed. 1. t. 39, which is not a good figure of any form known to me. The figure on the right hand side is likely for the form P. digitata, Wall. My specimens of P. cretica, are from Hackgalla, and Major Hutchison got this fern, Adiantum Capillus-veneris, and Asplenium varians from the road side below Hackalla. My specimens of this fern and of P. Hookeriana seem quite distinct, and can scarcely he confounded with each other.

60. Pteris Hookeriana, Agardh.

Bed. 1. t. 40. Not good. This is a very abundant fern in the forest of Kahatudua, near Porey, about 13 miles from Colombo, and I believe it is quite distinct from P. cretica. Bed. 1. t. 38. P. (pellucida) is surely for a young plant of this species. His fig 1. t. 40. is taken from a very stunted and bad specimen, and not characteristic for our Ceylon Fern. My Porey, specimens are from 1½ to 3 feet long, with the pinnæ of the barren fronds very broad. It is a large and more coriacious fern than P. cretica. See my remarks on 59.—N. B. that some of our common forms of P. 4—aurita are very like P. cretica.—See my Introductory remarks.

61. Pteris crenata, Sw.

Bed. 1. t. 35. This is one of the ferns collected by Paul Hermanu, in Ceylon in 1660, and is well figured in Burmann's Theasaurus zeylanicus, at t. 87.

This is one of our most common Ferns, growing in shady places and along road sides in the warmer parts of the Island.

62. Pteris quadriaurita, Retz.

Bed. 1 tt. 31, 41, 43, 44, and 219, Bed. 11 t. 89.—I have pretty well exhausted what I have to say about this fern in my introductory remarks, pp. 7-9, but I find I omitted to quote Bed. 1 t. 43 for P. longipinnula, of Wallich. I can see no difference whatever between this figure and several specimens in my possession of P. quadriaurita.

I find that I quoted Bed. 1 t. 40, at p. 8 instead of 1. t. 41. This is the most common and most variable fern in Ceylon, and is much affected according to soil and exposure.

I have several specimens taken from a fern brought from the neighbourhood of Mutton Button and grown by me in Colombo, which are very different from any others I have seen. It is a delicate and handsome fern, with long narrow pinnules, and having the lower pinnæ bipinnated, agreeing better for the term *qudriaurita* than any I have seen. See my remarks on No. 65. The variety B. argentea, with white mottled fronds has been found in Ceylon. The fern above referred to from Mutton Button, and grown in Colombo, is pronounced by Mr Wall after a careful examination of some of my specimens, to be my No. 66. Pteris (Campteria) patens, Hk.

63. Pteris pellucens, Agardh.

Bed. 1 t. 32. C. P. 3945. Discovered since the publication of Enum. Plant. Zeyl. Found in a belt of Forest in the Borders Estate Matella, Specimens

sent to me by Mr. James Grant. This is distinct from any form of No. 62, and is a delicate handsome fern.

64. Pteris (Pæsia) aquilina, Linn.

Bed. 1 t. 42. Who has read the Lady of the Lake, or has travelled much in the Kandyan country, and does not know the *Bracken*. I have quoted the full description from Syn. Fil. at pp. 9-10 with familiar remarks on its uses, and how to get rid of it when it becomes a pest on Coffee Estates.

The allusions to this Fern in "The Lady of the Lake" are the following:—

The heath this night must be my bed,
The *bracken* curtain for my head,
My lullaby the warder's tread,
Far, far, from love and thee, Mary!
Canto III, p. 127.

And patches bright of *bracken* green,
And heather black, that waved so high,
It held the copse in rivalry.
* * *

From shingles grey their lances start,
The *bracken* bush sends forth the dart.
* * *

Each warrior vanished where he stood,
In broom or *bracken* heath or wood.
* * *

The next but swept a lone hill-side,
Where heath and *fern* were waving wide.
* * *

The next, all unreflected shone,
On *bracken* green, and cold grey stone.
* * *

The riddle is already read.
Seek yonder *brake* beneath the cliff,—
There lies Red Murdock, stark and stiff.
Canto V, pp. 194, 202, 204, 205, 207.

65. Pteris (Campteria) biaurita, Linn.

Bed. 1. t. 44. I have stated nearly all I had to say about this fern at pp. 7—9. I am still of the same opinion, that the Campteroid arches in this supposed species, are an accident, the cause of soil, &c. My specimens of this fern from the Fort ditch at Hangwelle, are broad, large, and coarse compared with the common forms of P. 4-aurita. The plants of P. (C.) biaurita, cultivated by me have invariably lost their Campteroid arches after some time. Bed. 1. t. 44 is evidently taken from a young frond. Thwaites's C. P. 1048 for this fern, with its long narrow and delicate pinnules, is very different from the broad stiff coriaceous specimens procured in the Western Province, but I feel confident they are all one species, though I give this one a place here. After the letterpress of Pteris patens, Hk. Colonel Beddome has the following very appropriate notes:—

Sir W. Hooker informs me that "Campteria Anamallayensis," (Bed. 1. t. 45) of this work is "Campteria geminata" of Agardh, which species is referred by Sir W. Hooker as a synonym to "Campteria biaurita" (L). I feel quite certain that the two species C. Anamallayensis and bi-aurita are quite distinct, the venation and whole habit are different; if my plant is the same as Agardh's, the name "Anamallayensis" will however have to be changed to "geminata."

Campteria nemoralis, Willd. or what I take to be that species is not uncommon in the Presidency. In outline and general appearance it is in no way different from Pteris quadriaurita Retz., but whilst some entire fronds have quite the venation of Pteris and are consequently not distinguishable from "P. quadriaurita," other fronds or some of their pinnæ have the venation of Campteria, but with smaller costal areoles and fewer free veins than in "C. bi-aurita." I have always found this fern growing in localities where both Pteris quadri-

aurita and Campteria bi-aurita were also to be found, and suspect it must be a hybrid between the two. Mr. Bentham in his Hongkong Flora joins the two species "nemoralis" and quadri-aurita. In P. quadri-aurita, C. nemoralis, and C. bi-aurita, the veins always reach the margin, in C. Anamallayensis vever. And again after the letter-press for 1. t. 45, Campteria bi-aurita, Col. Beddome has the following remarks :—"Without examining the venation this fern is hardly distinguishable from Pteris quadri-aurita." I may here observe that the specific terms *bi-aurita*, Linn. and *quadri-aurita*, Retz. for these two supposed species, do not convey any correct idea of the difference in the ferns themselves. The following note by Baker after his description of Pteris (Campteria) biaurita, surely settles the point though it concludes with the words "doubtfully distinct".

"This differs only from *P. quadriaurita*, in the pinnæ being less deeply pinnatifid, and the bases of the midribs of the segments being connected by an arching vein. This arch springs normally from the bases of the midribs, but sometimes begins and ends at points between them. It is sometimes triangular, but sometimes very low, and in what Agardh considers as *P. nemoralis*, Willd, we have the venation considered as characteristic of *biaurita* combined with the entirely free venation considered as characteristic of *quadriaurita* in one and the same frond, so that they must be regarded as very doubtfully distinct."—See my remarks on 62.

66. Pteris (Campteria) patens, Hk.

Bed. 1. t. 205. This is a tall handsome fern and cannot be confounded with any other Ceylon Fern. Found in the very steep slopes of the forest between Oodowella and Kittulamulla Estates, in Hantane at Deltotte ; but I fear this habitat for it will soon be cleared, if it has not been so before now. It is the fern most liable to be eaten by insects in the herbarium of any I know. Great care is necessary in drying it, and it should then be poisoned to preserve it.—See notes on No. 62. Specimens of this fern grown in Colombo were very different from the common form found in the damp forests of Oodowella.

67. Pteris (Litobrochia) incisa, Thunb.

Bed. 1. t. 221. This is a beautiful and scandent fern, growing to a height of many feet in rich damp soil. Found in abundance in a belt of Forest separating Richland and Hatale Estates in Kalibokka. In Lindoola Patnas and other places not uncommon. It is very liable to be attacked by insects.

68. Pteris (Litobrochia) tripartita, Sw.

Bed. 1. t. 220. This is a very fine fern when found growing in rich soil It is a thick rigid and stunted fern when growing in exposed places in the Central Province, and a good deal like some forms of No. 62, but when found growing in old heaps of broken bricks between Colombo and Kadawella, it is a very fine large fern, but the finest specimens I have seen are to be found in the shaded gardens close to the Kacheri at Galle. I have got specimens here with the fronds from 6 to 8 feet in height, and the same in expansion. I saw some fine specimens in Captain Bayley's Fernery at Galle. This is also very liable to be eaten by insects unless the specimens are poisoned.

69. Ceratopteris thalictroides, Brong.

Bed. 1. t. 75.. This is a very common and remarkable fern, found generally in ditches, the edges of sheets of water, Canals, or damp places, often growing half submerged in the water. Long descriptions are given of the specimens collected by Hermann in Ceylon in 1660, by Linneus in his Flora Zeylanica, under two Nos. vizt. 376 and 377. The Specimens collected by Hermann more than 200 years ago, were in excellent condition when I saw them in 1857. I have no doubt this is what Moon, Cat. p. 76, has called Aspidium viviparum, with the Singhalese name, Ganga-miwana. It is nearly always viviparous, and its Singhalese name, *river*, or *acquatic* equally applies to it.—In the half stagnant canals near Colombo it grows sometimes to a height of 1½ to 2 feet. I know of no other fern that it can be confounded with. It is very liable to spring up in flower pots in Colombo, the spores being conveyed in the water used. One of the four tables illustrating the Flora Zeylanica of Linneus, 1747, t. 4. is a very characteristic one of this plant.

70 Lomaria Patersoni, var. elongata, Bl.

Bed. 1. tt. 28 and 28A. This is a very distinct fern from any other Ceylon one. Common in the damp forests of the Kandyan country. The young simple fronded plants are very unlike the older and pinnated ones. On the banks of a stream in the forest above Le Vallon in abundance, and elsewhere in the Kandyan country.

Tribe 7. Blechneæ.

71. Blechnum Orientale, Linn.

Bed. 1. t. 29. This is one of the most common ferns in the island, growing on banks of streams, or on moist rich cuttings along roads, fields, &c., from the coast up to 2000 or 3000 feet, and always remarkable by the redish color of its young fronds. It can be easily distinguished by this peculiar feature, and the traveller in the interior is sure to see abundance of this fern covering the steep damp sides of nearly every road in the Kandyan country. Miss Gordon Cumming took particular notice of this Fern during her travels in Ceylon.

72. Doodia dives, Kze.

Bed. 1. 222. "Woods of the Central Province." Thwaites. I found a good supply of this fern under the shelter of a large projecting rock, on the upper edge of Richland estate, Kalibokka, and in a similar situation amongst rocks in the forest between Galaha and Hingurugalla estates.

Tribe 8. Asplenıæ.

73. Asplenium (Thamnopteris) Nidus, Linn.

Bed. 1. t. 123 and 11 t. 197. This is one of the commonest and most remarkable of our Ceylon ferns, growing generally in the forks of trees, and very often accompanied by the beautiful ribbon ferns, Ophioglossum pendulum, and Vittaria elongata. Indeed it is no uncommon sight in the damp forests of the Western Province to find specimens of the Bird's nest Asplenium in the fork of a tree high over-head, with its fronds from three to six feet long, whilst from the singular mass of decayed vegetable matter in which it grows, the Ophioglossum may be seen like pendant ribbons sometimes twelve feet long, and the Vittaria from three to four feet long, and only about a quarter of an inch broad. The A. Nidus, is grown in large tubs in Colombo, and one of these sent by Mr. Layard to decorate the ball room for the Duke of Edinburgh measured from eight to ten feet across. The tops of columns of some of the ancient ruins in India seem to have been imitations of this fern. In page 400 of the 6th volume of the As. Researches, it is stated that boys rest on this fern.

74. Asplenium ensiforme, Wall.

Bed. 1. t. 125. Found on trunks of trees and faces of rocks in the damp forests of the Central Province. Beddome's figure is not a good one; the sori are much longer and narrower, and the fronds are more accuminated than shown in B's figure. It is not a common fern in Ceylon.

75. Asplenium normale, Don.

Bed. 1. t, 133. This is a very abundant fern growing in rich vegetable soil in the shaded forests of the Central Province. It can scarcely be confounded with No, 78, the one most like it.

76. Asplenium Wightianum, Wall.

Bed. 1. tt. 126, 127. This is an abundant fern growing on the trunks of trees or sides of rocks in the higher forests of the Central Province, and is

a most variable plant. None of its forms, however, can be confouuded with any of the other species. Baker describes this one on p. 199, No. 50, in Syn. Fil., and on p. 201, No. 59, he gives a description of A. vulcanicum, Blume, but so gradually do all our Ceylon forms of these two supposed species run into each other that Thwaites includes them all in his C. P. 1010.

76/1. Asplenium vulcanicum, Bl.

No figure of this supposed species is given by Beddome, and the descriptions in Syn. Fil. of this one and of 76, do not convey any correct idea of a specific difference.—I have collected fine large specimens with broader pinnæ than usual in some of the gullies running down from the side of the Great Western into Scalpa, and have received still finer specimens from Mr. Mc Micking collected at Neura Elliya, of the form said to be A. vulcanicum, Bl. and as Mr. Wall believes it to be a distinct species, I give it a place here, and the following note on it by Mr. Wall :—A. vulcanicum, Bl. seems distinct from *A. Wightianium* in habit, texture and colour. The two species do not appear to be connected by any intermediate form in the herbarium at kew, nor have I seen the connecting forms mentioned by Dr. Thwaites in his 'Enumeratio,' p. 383. About Newera Ellia some sportive forms of this species are to be found, in which the lobes at the points of the pinnæ are prolonged fantastically to an inch or more in length by about a line in width."

77. Asplenium tenerum, Forst.

Bed. 1. t. 224. A common fern growing on the trunks of trees and the sides of rocks in the higher forests of the Central Province. Easily distinguished from any of our other Ceylon Ferns.

78. Asplenium erectum, Bory.

Bed. 1. t. 135. As A. Braziliense, Raddi, and 1. t. 134. as A. trapeziforme, Rox. this latter being equal to the form A. lunulatum, Sw. and C. P. 1336. placed by Thwaites as a form of 84, A. resectum, but they are distinct, the caudex of the latter being a creeping one, and of the other erect. I noticed this marked difference when collecting these two ferns lately, and an examination of Mr. Beckett's specimens showed that he had made the above corrections long previously. This one and No. 75, are found in great abundance in the same places, in the forests of the Central Province. Why this fern with its drooping feathery fronds should have been called A. erectum. I do not know, but Botanists are bound to stick to first names whether rightly or wrongly given.

79. Asplenium zenkerianum, kunze.

Bed. 1. t. 128. This is not an uncommon Fern growing in rich soil in the Forests of the Central Province, and like some of the other species liable to become proliferous when the ends of the fronds touch the ground. This fern and 108, Allantodia, are most difficult to dry, and to preserve them after they are so. This fern has been described and figured as the A. persicifolium, J. Sm. but to the Postcript to Mr. Wall's Catalogue of Ceylon Ferns, I am indebted for the following :—" Our Ceylon species is A. zenkerianum of Kunze, and is now regarded as distinct from the typical form of the Phillipine—Island original, differing therefrom in its shorter sori, entire edge and less woody stipes."

80. Asplenium falcatum, Lam.

Bed. 1. t. 142 good for C. P. 1339, and 1. t. 143.—According to the descriptions in Syn. Fil. there can be no doubt but Thwaites has transposed the names of A. falcatum and A. caudatum,—the latter being a highland, and the former a lowland fern.—A. falcatum is a common fern in the Western Province, sometimes growing in the forks of trees, but generally, in loose vegetable mould, on the tops of small rocky hills, not far from Colombo. Its size and cutting are much affected according to soil and exposure.—On a long rocky ridge at Tallangama, about eleven miles from Colombo, on the road to

Porey, every form of this fern from the simply pinnated, to the bipinnated A. affine No. 88 can be collected. On the exposed ends of the rock, where there is but little soil, the pinnæ are simple and less gashed, but towards the centre of the rock, where the shade becomes dense and the soil deep, the gashings, increase until they at last become separate divisions of the primary pinnæ. I feel quite sure therefore that Bed. 1. tt. 225 and 226, are for mere forms of this Fern, agreeing with C. P. 2905 and 1341. But see further remarks on 81 and 88. A. falcatum has the sori in long lines from the rachis to near the edges, whilst in A. caudatum they are generally in paralled rows close to the midrib. A collection of Ferns made by me on the lower Badulla Road, between the Maha Oya and Gonegamma, and elsewhere, especially of the A. affine form, since the foregoing note was written, convinces me still further that some six to ten of our supposed species of Aspleniums are mere forms of one variable species, very much affected in their size, hairiness, mode of cutting &c. by the soil, and climate in which they are found.

After the letter press of tt. 148-9, Beddome has the following note. "Variety B. has the pinnules shaped more like those of A. spathulinum, (J. Sm.) a Ceylon species, the sori of spathulinum, however, are longer and extend to the margin. The following 5 species—Aspl. nitidum, Sw. Aspl. cuneatum, Lam.; Aspl. affine, Sw. Aspl. spathulinum J. Sm.; and Aspl. laserpitifolium Lam., are all very closely allied, and it is no easy point to decide to which species any fern of the cuneatum group should be referred." Baker's note on the four or five species which follow Aspl. cuneatum, indicate the same affinity between those supposed species.

81. Alplenium caudatum, Forst.

Bed. 1. tt. 140 and 141. I have never found this fern except in the hills and generally in crevices of rocks or on the trunks of trees, whilst A. falcatum is an abundant fern near the coast, see what I have said on 80 and 88. The following is Mr. Wall's note on this Fern:—"Asplenium caudatum, Forst. is distinguished from the forgoing species (A. falcatum) by its two parallel rows of sori close to the rachis, in addition to which it has often other short oblique sori. It is very variable in regard to the shape and cutting of the pinnæ." Mr. Wall does not in his Catalogue quote any of Beddome's tables for this fern, but I think there can be no doubt that the two quoted by me above are for this one. Bed. 1. t. 140 Aspl. contiguum, Klfs., is good for our typical form, and the following words of the description given agree for it well,—"Sori contiguous, parallel with the costa," whilst Bed. 1. t. 141. (Named Aspl. falcatum) can scarcely be for any other fern except A. caudatum, tt. 140-141 are nearly identical in essential characters, After 1. t. 143, called erroneously Aspl. caudatum, Beddome has the following further note:—"The above five species of the (simply pinnate) furcatum group, viz., planicaule—contiguum—falcatum—macrophyllum, and caudatum are very closely allied, and Botanists do not agree as to the limits of the species." Swartz puts A. caudatum into the bipinnatifid to bipinnate section, and Willdenow into the bipinnatifid. I have shown elsewhere that our Ceylon A. affine, is a bipinnatifid form of A. falcatum.

82. Asplenium Gardneri, Baker.

In my list I had this fern down as A. macrophyllum, Sw., and the following is my note on it in reference to this latter name:—

Under this name Beddome figures the fern which is undoubtedly A. falcatum. C. P. 1340, judging from the description in Syn. Fil., must be a very small form of A. macrophyllum, which is not an uncommon fern on rocks and trunks of trees in the damp forests of the interior. The specific name is certainly not applicable for our Ceylon specimens of this fern, for which Beddome gives no figure.

I have made the correction from Mr. Wall's Catalogue, and now quote his note on it:—"Asplenium Gardneri, Baker. This plant has been hitherto known in Ceylon as A. macrophyllum, but a careful comparison of our species with all the forms of A. macrophyllum represented in the Kew Herbarium seems

to prove it to be distinct. Gardner's specimen represented the plant imperfectly. Better specimens since received exhibit the character of the species more fully. Mr. Baker calls it A. Gardneri, and the old name A. macrophyllum, therefore, disappears from our Ceylon list."

83. Asplenium formosum, Willd.

Bed. 1. t. 136. This fern was found by Thwaites in the forests above Galagama, towards the Horton Plains. I have never seen any but the specimens collected by him, and Mr. Buxton Laurie, and it must I think be a rare fern in Ceylon. It is a good deal like small forms of 78, A. erectum, but the pinnæ are deeply dissected in A. formosum.

84. Asplenium resectum, Smith.

Bed. 1. t. 132. This is a very variable Fern, and Thwaites has no less than five C. P. Nos. for it, but I think there can be no trouble in identifying them all as for this fern, which is a common one in the forests of the interior, with the exception of C. P. 1336. figured by Beddome 1. t. 134, as the A. trapeziforme, Rox; and which is equal to the A. lunulatum, Sw., undoubtedly a form of 78, A. erectum, as shown above. Under the impression that Thwaites was correct in calling his C. P. 1336 a form of A. resectum, I was much puzzled on a late occasion when collecting these two ferns in the forests in the vicinity of the Great Western, in Dimboola. I noted that A. resectum had in every instance a long creeping rhizome, with scattered fronds, whilst the other had an erect caudex, and the fronds tufted. I then came to the conclusion that if the Aspidium (Polystichum) aristatum, Sw., with a *creeping rhizome*, should be separated from Aspidium (Polystichum) coniifolium, Wallich, in consequence of its *erect caudex*, that the above two ferns should also be separated, and when spending an evening with Mr. Beckett shortly after he showed me his notes proving that he had made the necessary corrections as shown at No. 78.

85. Asplenium heterocarpum, Wall.

Bed. 1. t. 131. This is a beautiful fern and is found in the same localities as Nos. 75 and 78. The sori are on the toothed edges of the pinnæ.

86. Asplenium planicaule, Wall.

Bed. 1. t. 139. I cannot find amongst a considerable number of variable specimens collected by me, any one like Beddome's figure of the Indian plant. A comparison of my specimens of this fern convinces me that in every respect it is the simply divided form of the next one, A. furcatum, just as A. falcatum is of the A. affine, and the same remarks exactly apply to A. planicaule and A. furcatum in respect to the passing of the one to the other.—Found on the trunks of trees in the forests of the Central Province.

87. Asplenium furcatum, Thunb.

Bed. 1. t. 144. As stated above, my specimens of this fern indicate that it is simply a more compound or more deeply dissected form of A. planicaule just as A. affine is of A. falcatum, see my notes on these as exactly applicable to this one, and 86.—This is not such an abundant form as No. 86.

88. Asplenium affine, Sw.

Bed 1. t. 226, 225, and 149? The more I look at all the figures in Beddome for this group of ferns, and at my own specimens, the more I am inclined to say "contusion worse confounded"! I am now nearly convinced that the next one, A. nitidum, is an Alpine form of this fern, and that Nos. 80, 81, 87, 88, and 89 so run into each other, that they are forms of one variable species, and that specimens carefully collected from the coast up to the greatest elevation at which they are found to grow, and then carefully arranged, according to their variations would go to prove that all of them, and several other supposed species are mere forms of one variable species.

89. Asplenium nitidum, Sw.

Bed. 1. t. 148, and 149? I quoted Bed. 1. t. 149 for the preceeding also with a doubt. A. nitidum, is an alpine fern, found in great abundance (three years ago) in the Forest between Mattakellie and Raddella in Dimbula, growing on the trunks of trees. Some of the alpine specimens of No. 88. and this one have got so mixed up in my collection that I would be afraid to attempt to separate them. A. nitidum is a very variable fern. See what I say at 80, 81, 86, 87. and 88, in reference to this. A Cape specimen of A. cuneatum is not unlike some forms of No. 89.

90. Asplenium varians, Hk. and Gr.

Bed. 1. t. 129. This is a delicate fern and can scarcely be confounded with any other Ceylon one. Found in Oova, road side below Hackgalla, and in the Forest after leaving Radella on the bridle path to N. Elliya 3 years ago.

91. Asplenium tenuifolium, Don.

Bed. 1. t. 130. A delicate and much dissected fern, found on the banks of streams in Newera Elliya by Thwaites. My specimens are from Major Hutchison.

92. Asplenium (Darea) rutæfolium, Kze.

Bed. 1. t. 138. This is a very handsome fern found in great abundance on the faces of large boulders in a stream near Hewissa in company with Davallia Emersoni.—It is somewhat like the last species, but when together easily distinguishable.

93. Asplenium (Athyrium) Hohenackerianum, Kunze.

Bed. 1. t. 150. The C. P. 3867 indicates that this fern was found in Ceylon since the publication of the En. Pl. Zeyl. "It has the habit of a small form of *Filix-fœmina* but with more sausage-like sori and a fibrillose stem."

94. Asplenium (Athyrium) macrocarpum, Bl.

Bed. 1. tt. 152 and 153. When growing in rich soil and in well shaded places in the hills, this fern has a peculiar lead color underneath, and until carefully looked at, is very liable to be taken for a Lastrea. Indeed the involucres of this fern are so nearly reniform that Moore places it in *Lastrea*. This fern and the larger form of 118, Nephrodium (Lastrea) calcaratum, Hk. when growing in the shade of dense forest, can at once be recognised by the shining lead color of the involucres, and the under sides of the fronds.

95. Asplenium (Athyrium) nigripes, Bl.

Bed. 1. t. 157 for a small and very common Form of the C. P. 1344! The following note by Mr. Wall in his Catalogue, is in such perfect accordance with my own idea on the subject that I propose separating the ferns in my possession, and which have been rolled up into the above supposed species, into three numbers, two of which I shall insert after the several clauses of Mr. Wall's note thus:—[95/1 W. F. 95/2 W. F.] "Asplenium nigripes, Bl. embraces a wide range of plants of seemingly very different types. The smallest has a deltoid frond not more than six inches each way, and is common in the Forests about Newera Ellia, [This one not collected by me, W. F.] The next, in point of size, has an oblong-lanceolate frond and about twelve inches in length, closely resembles *A. Filix-Fœmina* in cutting and is distinguished by long reddish spines on its rachis; this also grows about Newera Ellia, and is not uncommon. [My No. 95/2 below W. F.]. The largest attains a hight of five to six feet, and grows on the banks of streams. This is *A. gymnogrammoides* of Klotsch, as figured by Beddome 1. t. 156. [My No. 95/1 W. F.]. These forms differ from each other in important characters, besides the great disparity of size, such as the cutting and form of the pinnules, and in the color and shape of the scales at the base of the stipes. They do not seem to be sufficiently connected by intermediate forms to be included under one species."

Several hundred specimens of a small *bi-pinnated* fern collected by me in the Forests of upper Dimboola, and agreeing entirely with two specimens of

the C. P. 1344, from the Peradeniya Herbarium, and called on the ticket A. Asplenium (Athyrium) gymnogrammoides, Kl. agree also with the description in the Syn. Fil. for A. (Athyr) nigripes, Bl. p. 227. with this exception that the lower pinnæ are not often six to nine inches long, and that instead of being "cut down to the rachis into numerous elliptico-rhomboidal piunules, which are broadly lobed about half way down and the lobes slightly toothed," our Ceylon Fern has the lower pinnæ from three to five inches long, with numerous alternate or sub opposite, *stalked* or subsessile pinnules, which are decurren towards the ends of the pinnæ; the pinnules being sub-falcate, lanceotatte, with an auricle on the upper side, running parellel with the rachis, whilst the lower sides next the rachis are quite oblique. The rachis is slender, *straight* straw colored, and not *flexuose* as *described* and *figured* by Beddome. Amongst my numerous specimens I have not a single *tripinnate* one of this form. A few of my specimens have the pinnæ and the pinnules so close to each other that they overlap to a considerable extent, and I have a few, evidently *young fronds*, grown in rich soil, with the pinnules nearly entire with the exception of a large basal aricle. The sori are young and they and the pinnules have a light golden color. I noted these as a species of Diplazium, and I find that Mr. Baker made the same remark on similar specimens in Mr. Wall's collection. I have no form of this abundant fern which connects it with Nos. 95/1 and 95/2.

It is a good deal like small forms of 124; (Nephrodium (Lastrea) sparsum) in general appearance, but the involucres are different, and the shining golden appearance of these on No. 95, when the specimens are nicely dried, is a characteristic distinction.

95/1. Aspl nium (Athyrium) gymnogrammoides, Klotsch.

Bed. 1. t. 156. Beddome gives no description for this plate, but after that of 1. t. 155 for A (Athy.) pectinatum, Wallich; corrected in the letter-press of 11. t. 295., into A. (A.) aspidioides, Schl: he has the following remarks:—"A very variable species, the figure represents nearly two-thirds of a a frond (the apex and stipe wanting). Athyrium aspidiodes, Schl: is, I believe, only one of the more compound and more finely cut varieties of this species, there are numerous intermediate forms—Athyrium gymnogrammoides, Kl. specimens of which I have received from Ceylon through Mr. Thwaites (C. P. 1344) seems to differ in in its much larger pinnæ, (14 inches long,) and in its more regular Asplenoid sori. Plate No. 156 is a drawing from Mr. Thwaites's specimen, it is recorded by Sir W. Hooker as from the Nilgiris, but I have never myself met with it." Beddome's 1. t. 156, and the allusion to the size of his Ceylon specimens, are both pretty good for a large coarse, rough, and deeply toothed fern found lately by me close to Mr. McCall's house on the banks of the river in Maskeliya, and no where else by me. This fern is so different from any other known to me that I shall give a few notes descriptive of it. The sori on this fern are generally so *long* and *straight*, that I looked through all Beddome's figures of Diplaziums for it, and concluded it to be near A (Diplazium) polypodiodes, but a subsequent look convinced me it had characters agreeing more with the Athyriums, and an examination of some specimens of a large Athyrium collected by Mr. McMicking near Neura Eliya, confirmed me in this view, and also that my fern is likely to be a very coarse luxuriant form of Athyrium gymnogra mmoides. I had written thus far when Mr. Wall very kindly sent for my inspection a set of Diplaziums which he submitted for the opinion of Mr. Thwaites, and which were supposed to connect the C. P. Nos. 3100 and 3332. In this packet I find some specimens of my Maskeliya fern above referred to, on the ticket of which Mr. Thwaites has written "C. P. 1344, a coarse form." I cannot perceive any resemblance between the specimens of C. P. 1344 already referred to at 95, except that the sori in both are "principally in two parallel rows close to the midribs of the pinnules" ex Baker. Referring to my remarks on 95, I now give some notes descriptive of my coarse Maskeliya fern, following the order in Syn. Fil: Stipes tufted, 2 to 3 feet long, dark brown, erect, exceedingly asperous, especially when growing, having dark prickles, and straw colored peltale scales

along its whole length, most of the scales falling off during the operation of drying, nearly free from scales below; frond 2 feet 6 inches to 3 feet long, and about 2 feet broad, in all my specimens *tripinnate*, ovate lanceolate, with numerous pinnæ on each side, the lowest from 1 foot 6 inches, to 2 feet long, 5 to 6 inches broad, long lanceolate, with 6 to 12 pairs of secondary alternate, shortly stalked lanceolate pinnæ, the upper ones decurrent; secondary pinnæ with 8 to 12 pairs of alternate, elliptico-lanceotate *decurrent* pinnules, which are deeply serrato-dentate. In all my specimens the pinnules are decurrent from a broad base. All my specimens of this fern have dried of a dark brown color, and have a coarser texture than the specimens of A. nigripes, collected in Dimboola and bearing the C. P. 1344. A Queensland specimen of a fern named "*Athyrium australe, Brack,*" is the fern most like my Maskeliya one I have seen, but it is a more herbaceous plant, and the divisions are all smaller. It is also a *tripinnate* fern, having short stalked secondary pinnæ, and decurrent pinnules so like our Ceylon plant, that I believe they belong to the same species. Beddome's figure (1. t. 158) for A. anstrale Brack, is for a small *bipinnate* fern and can scarcely be a form of the Queensland or Ceylon Fern. Both Beddome's figures, and the descriptions in Syn. fil. are very unsatisfactory in respect to our Ceylon forms of the Athyrium group. Since writing the above I have got a look at the first 3 vols. of Hooker's Sp. Fil. and the description, as there given in vol. 3, for A. (Ath:) umbiosum, J. Sm. agrees so well for my Fern that I conclude they are the same.

95/2 Asplenium (Athyrium) Filix-fœmina, Bernh.

Bed. 1. t. 154.? The fern which I mean to be included under this name, is the C. P. 3067, on which Thwaites has written, "Asplenium (Athyrium) nigripes, *Mettenius*," not of Blume as quoted by Baker for No. 95. For this Thwaites quotes as a synonyum *Athyrium tenuifrons*, variety *straminea*, Moore, and states that it is found in the forests of the Central Province at an elevation of 4000 to 6000 feet. This is a very small delicate fern found in grassy places at a high elevation. My specimens were received from Major Hutchison. About this form of the A. Filix-fœmina, Baker remarks:—"*A tenuifrons*, Wall., is like *A. molle*, but with the midrib of the pinnæ, and pinnules "beset with firm yellow spines or strigillæ as is also the case with various Indian, Ceylonese, and Javan forms, with narrower, more slender, and more straggling pinnæ and pinnules, as *A. gracile*, Don.; *A. stramineum*, J. Sm.; *A. tenellum*, Wall.; and *A. proliferum* Moore." There are the *strigillæ* referred to on our Ceylon specimens, but they are so inconspicuous that the use of a Lens is required to distinguish them. Small specimens of No. 96, are very like this plant, and Bed. 1. t. 154 though named for 95/2 is much more like 96.

96. Asplenium (Athyrium) aspidioides, Schlet.

Bed. 1. t. 155? this figure was given as Athyrium pectinatum, Wall.; but in a note after the letterpress of Bed. 11. t. 295, he says that it is for 96. Bed. 1. t. 154, quoted with a doubt for 95/2, is more like my specimens of 96. This is a very handsome, and a very abundant fern on the banks of streams in the Lindoola Patnas and in similar places in Nuwara Eliya Plains. I may here remark that the figures in Beddome's ferns for this group have been mixed up in such a manner that I cannot pronounce them satisfactory as most of his others are. Indeed in the note to Bed. 11, t. 295, he makes the following remarks:—"The more I study this group I am inclined to think that the different forms of *Filix-fœmina*, *pectinatum*, or *aspidioides* and *fimbriatum* (and perhaps some other species) run so one into the other that it is almost impossible to distinguish them satisfactorily and that the only chance of doing it would be by a careful examination of numerous plants growing in their natural habitats."

97. Asplenium (Diplazium) assimile, Endl.

Bed. 11. t. 294, for C. P. 1347, good. But on the label Thwaites calls it Asplenium (Athyrium) australe, Brack, and remarks:—"The more deltoid and flaccid fronds and their smaller ultimate divisions distinguish this species from the preceding one" (No. 95.) The C. P. specimens, and Beddome's good figure

are entirely for a *Diplazium*, and the following is Beddome's note after the description of 11 t. 294. "This species has been included by Sir W. Hooker in his Species Filicum under Athyrium australe, Brack, (which is united with *umbrosum*, J. Smith, by Mr. Baker;) it however has a quite different involucre to the South Indian species figured under that name at pl. 158 of the ferns of Southern India, and it is more flaccid and delicate, and is tripinnate, (subquadripinnate) with the ultimate segments subentire, whereas A. australe is tripinnate (subtripinnate) with ultimate pinnules much toothed, these latter differences however are not always constant, or much to be depended upon as a specific difference in large compound ferns of this sort, as young or even small grown specimens may be bipinnate, when larger specimens of the same species are tripinnate."—Again in the last No. of Bed. 11., in "Notes on the Nomenclature." He says that, "Diplazium assimile, and D. Jerdoni, are also both considered as forms only of D. polypodioides."

My Queensland specimen, marked Athyrium australe, is a true *Athyrium* and quite different, as far as I can see, from Bed. 1. t. 158, under this name and 11. t. 294. Our Ceylon Fern is so distinct in all respects from any specimen of Athyrium, or form of Diplazium polypodioides, that I have no hesitation in stating my belief that it is a distinct and well marked species, which cannot be confounded with an Athyrium, nor with any of our Diplaziums. I suspect that the name on the C. P. 1347 is a mistake, but whether it is the true A. (D.) assimile of Endlicher is a question which I have no means of deciding. This fern is found sparingly in Kalibokka and Hewahetta, and in abundance in Maturatta, and above the Agras, &c., below the Bopats.

98. Asplenium (Diplazium) lanceum, Thunb.

Bed. 1. t. 227, and 11. t. 289. Beddome figures and describes the latter as D. subserratum, Bl., and gives Penang and Java as its habitat, but I have Ceylon specimens to agree with both figures. This is a well marked species, found in great abundance in damp ground in the Forest below Maousakele, Kalibokka, and Dimbula.

99. Asphlenium (Diplazium) Zeylanicum, Hk.

Bed. 1. t. 228. Found together with the preceding species often on the rich banks of streams. A well marked Fern.

100. Asplenium (Diplazium) sylvaticum, Presl.

Bed. 1. t. 161. and 11. t. 243. In his ample note on the habitat of this fern, Baker remarks:—"Of forms included here differing slightly from the type, the Malayan. *A. Prescottianum*, Wall. (Bed. 11. t. 243), has the pinnæ rather more deeply lobed towards the base in the lower part of the frond; the Ceylonese *A. elatum*, Mett. (C. P. 1349), and a similar plant from the Sandwich Islands and Borneo, have them lobed throughout to a depth of quarter inch; the lobes subangular and toothed."—I find C. P. 1349 attached to the most common, and less loped form of our Ceylon fern, and in fact Thwaites has not two C. P. Nos. for it, showing that he looks upon the two forms as one No. Bed. 1. t. 161. is evidently for a very small or very young plant. Cultivated in Colombo or as seen in the forests of the interior, the common narrow and less lobed form can be seen running into the other, and the lobed one into A. (D.) latifolium, Don. In fact a small plant of 100 grown by me in Colombo produced one bipinnated frond like one of 105, and here again we have a simply pinnated fern running off into a bipinnated one. Why these two supposed species are separated by no less than 32 species in the Syn. Fil., and some of them differing widely, I do not understand. In numbering this list I have followed the order of the Syn. Fil., otherwise A. (D.) latifolium should have been 102 instead of 105.—After I had written this note I noticed the following by Bed. after description of his 1. t. 162: —"This and the last species, D. Sylvaticum, are both very variable, and it is doubtful if the two are really distinct)."

101. Asplenium (Diplazium) polyrhizon, Baker.

Bed. 11. t. 292. For A. (D.) decussatum, Wall., and C. P. 3951. Th. Peradeniya Herbarium has, through the exertions of its Director, and the feeline of reciprocity of those of the Calcutta one, received a considerable number oS the duplicates of the Wallichian Herbarium, and when Thwaites adds to the C. Pf label, the words "*Wall. Cat*, 2208," we may take it for granted that a comparison was made, and that the note is correct. We, therefore, know that this fern is the A. (D.) decussatum of Wallich's list of Indian plants, and in the note after the habitat of A. (Dipl,) lasiopteris, Mett. Syn. Fil. page 235, No. 228, Baker states that Wallich's fern is identical with A. (Dipl.) Japonicum, a good deal of trouble is thus saved in trying to disentangle this one from the next one, A. (D.) Schkuhrii, Hk., wrongly quoted by Baker as a synonym of the A. (D.) Japonicum. The two ferns are quite distinct as far as I can see. The descriptions of these two ferns seem to have been transposed in the Syn. Fil. under No. 226. The A. (D.) polyrhizon is a small flaccid fern compared with the other and as far as I know a very rare one in Ceylon. Beddome's remarks after his desrcpition of A. (D.) decussatum are quite appropriate:—"The specimen figured is from Ceylon (C. P. 3951) and I have lately found it on the Tinnevelly hills; it is nearly allied to D. lasiopteris, but has a different caudex. Mr. Baker refers it to Diply. Schkuhrii, Hk., Bed. 1. t. 230, and places both under D. Japonicum, *Thunb.* which has a creeping caudex. The species that I have figured as D. Schkuhrii, has an erect caudex, but is bipinnate in its larger fronds, which this species appears never to be."—See my remarks on the next one.

101/1 Asplenium (Diplazium) Schkuhrii, Thw.

Bed. 1. t. 230 for a small frond of C. P. 3100. Moore in the Index Filicum pp. 227 and 337, has so mixed up the C. P. numbers for Diplazium dilatatum and this one that it is quite impossible to disentangle them, Gardner's No. 1059 being quoted for both ferns. Baker has quoted this fern as a synonym for A. (D). Japonicum I therefore conclude that good specimens of the C. P. 3100 did not then exist in the Kew Herbarium. This fern looks very distinct in many respects, and is often a large bipinnate fern, whilst the other is a small simply pinnate and flaccid one. Thwaites gives Ambagamuwa and Saffragam Districts for it. My specimens were collected near the bridle path, on the banks of the first stream, in a belt of forest, on the way from Le Vallon Estate to Deltota, and I have lately collected abundant specimens of it in Dimboola and Maskeliya. —See notes on the former No. 101.

102. Asplenium (Diplazium) Thwaitesii, A. Br.

Bed. 11. t. 291, and 1. t. 160? My first specimens of this fern were collected amongst stones in the Hulankanda Estate in Kalibokka. It is abundant in the forests near the Gap into Matale, on the ridge between Nilambe and Deltota, and in Dimbula. It is a soft flaccid and hairy fern, peculiar to Ceylon, if it be not identical with A. (D.) lasiopteris, Bed. 1. t. 160, quoted above with a? Baker says that this latter is "well figured by Beddome" in this table. My own belief is that they are not distinct. After 1. t. 160, Bed. remarks:—(Asplenium Thwaitesii (C. P. 1343), a specimen of which has been forwarded to me by Mr. Thwaites from Ceylon, seems hardy distinct," and again, after the description of 1. t. 230, he adds: "Diplazium Thwaitesii, appears to be the same as D. lasiopteris (Kunze) t. 160 of this work; they are both always simply pinnate, and the pubescence is the same. The pinnæ in my specimens of *Thwaitesii* are more approximated than in *lasiopteris*, and the pinnules are more obtuse and less falcate, but they can hardly be more than varieties." At 11. t. 291 he adds: "The specimen figured is from Ceylon. It is nearly allied to D. lasiopteris, and until I lately received copious specimens from Mr. Thwaites I had referred it to that species."—I believe they are only one species. There can be no doubt that Bed. 1. t. 160 for A. (D.) lasiopteris, is a better one for our very common Ceylon form of A. (D.) Thwaitesii, than his 11. t. 291. which

is for a very luxuriant specimen evidently from a rich, damp and shaded place. I have specimens agreeing with this latter from rich soil on the banks of a stream near Mr. McCall's House in Maskeliya. It is my belief that the original specimens of A. (D.) Japonicum, Thunb, Thwaitesii, A. Br., and lasiopteris, Mett. with their "*wide creeping rhizomes*" and villose stipes and fronds, are all one species, which should retain Thunberg's oldest name A. Japonicum, from which Wallich's A. decussatum, with an erect caudex, and now called A. (D.) polyrhizon, Baker, and A. (D.) Schkuhrii, Thw. also with an erect caudex, must of course be separated. I shall now give Mr. Wall's note in his Postscript on this group, and with reference to his doubts about the distinctness of the C. P. Nos. 3332. and 3100, Mr. Thwaites's note on Mr. Wall's suit of specimens already referred to, indicate that he considers them distinct.

Asplenium Japonicum, Thumb.—The Japanese type of this species resembles very closely our *Aspl. Thwaitesii,* insomuch that the only present representative of the species at Kew from Ceylon was sent by Dr. Thwaites as a "large form" of *Thwaitesii,* and with the same C. P. number, 1343. This number therefore represents both species in part, if, in fact, the two are really distinct. C. P. 3951, mentioned in the list of Dr. Thwaites' addenda, page 11, as *Aspl. Decussatum,* Wallich, and hitherto referred to *A. Japonicum,* is a good species, differing from *Japonicum* chiefly in having an erect caudex. As there is already an *Aspl. Decussatum,* however, Mr. Baker gives the Ceylon species the name of *A. Polyrhizon,* owing to its dense mass of wiry roots. This is the species figured by Beddome in plate 292 of his 'Ferns of British India."

Another Ceylon species included under *Japonicum* in the first edition of the Synopsis, will appear in the second as *A. Schkuhrii,* Thwaites. This plant has also an upright caudex. Its C. P. number is 3100, and it is figured in Beddome's 'Ferns of Southern India,' plate 230. To me this seems to run too close to some forms of the very variable species *Dipl. Decurrens* of Beddome, which=*A. Maximum,* Don.

103. Asplenium (Diplazium) polypodioides, Mett.

Bed. 1. t. 163, and 11. tt. 293, and 327. This is a most abundant and very variable fern, found from the Fort ditch at Hangwella, about 19 miles from Colombo, up to the higher altitudes of the Kandyan country, and vying in size with some of our tree ferns, when growing in rich soil on the banks of streams. It will grow easily in pots or in a fernery in Colombo.—My specimens of Nos. 104, 105, and 107 were all put up in the same packets with 103, and my impression is that 100, 103, 105, and 107 will all be found to run gradually into each other, but see my notes on these.

104. Asplenium (Diplazium) decurrens, Beddome.

Bed. 1. t. 229. C. P. 3332. Thwaites gives this as a variety of the above, and asks if it be a distinct species, and gives Ambagamua as its habitat. My specimens were with difficulty separated from the packets containing 103, and must have been collected in Kallibokka.—It seems a well marked species, of thinner texture and lighter color than 103. Baker says of it. "A common Indian plant, like A. sylvaticum (100 above) in texture, a single lower pinna of this resembling a whole frond of that."—None of my specimens indicate this resemblance. I have lately (March 1874) collected abundance of this Fern in Maskeliya near Mr. McCall's House, not far from Adam's Peak, and though some specimens of 101/1 A. (D.) Schkuhrii show a *decurrent* tendency in their extremeties, they seem quite distinct. No. 100 A. (D.) sylvaticum is most likely only a young form of A. latifolium as already hinted at, but I cannot see any marked resemblance between our Ceylon specimens of A. decurrens and A. Sylvaticum. What A. maximum Don, for which Baker quotes A. decurrens, as a synonyum is, no one seems well to know, but as the latter seems a well marked Ceylon Fern I retain Beddome's very characteristic name for it. I have specimens of a fern collected in the belt of Forest separating Dimboola from Maskeliya, which may be a young state of A. decurrens, growing in a more exposed

situation, but at present I am not satisfied that it is a form of this or any other Ceylon Fern known to me. On the specimen Thwaites's note is, " A. starved form of C. P. 3332 no doubt." I have quoted Mr. Wall's note on A. Japonicum elsewhere.

105. Asplenium (Diplazium) latifolium, Don.

Bed. 1. t. 162. An abundant fern in the higher forests of the island.—I have written fully about this fern in my note on 100 of which this is most likely a luxuriant and older plant. My specimens of this and 107, A. (Anisogonium) Smithianum run a good deal into each other, but see my note on this latter No.

106. Asplenium (Anisogonium) esculentum, Presl.

Bed. 1. t. 164. This is one of the most common, and best known of our Ceylon ferns.—The young fronds of it are universally eaten as greens in various parts of the world where it is found, and is sold in all the Markets in the Western Province, under its Sinhalese name " *Miwana Kola.*" I eat a curry made of this fern on my way to Ratnapoora in 1840. It is one of the most common vegetable curries amongst the Natives. It is a good deal like 103 in general appearance, but easily distinguished from any of the diplaziums by the regular *anastomasing* of its veins.—This and one or two species of Nephrolepis are the ferns most commonly cultivated in Colombo.

107. Asplenium (Anisogonium) Smithianum, Baker.

Bed. 11. t. 332. My specimens of this fern were found mixed with those of 105. A. (D). latifolium. This fern is peculiar to Ceylon. Baker says " it differs from *latifolium* by its oblique caudex and anastomosing veins and asperous stipes." It differs also a good deal in the shape of its pinnules, but as far as the anastomosing of the veins are concerned, I have specimens in which they are nearly all free to the edges, and specimens collected by Mr. Buxton Laurie in Morawakka, have most of the veins free, and otherwise a good deal like some of the forms of 103.

My remarks on the arching of the veins in Pteris (Campteria) biaurita, and on Pteris quadriaurita, Nos. 62 and 65 may be referred to in reference to this fern.

108. Allantodia Brunoniana, Wall.

Bed. 1. t. 159. This is a common fern on the banks of streams or growing in damp rich soil in the Kandyan country. Its sori are like little sausages and hence its generic name. It is most difficult to dry it, and it is very liable to rot or to be eaten with insects afterwards, unless it is dried with great, care and poisoned afterwards. See my note on 79. I found specimens of this fern in rich soil, and in dense shade in the reserved forest on Holywood, upwards of 8 feet in height.

109. Actiniopteris radiata, Link.

Bed. 1. t. 124. This fern looks like a Fan Palm in mineature, and is easily distinguished from any other known fern. It was found by the late Dr. Gardner at Trincomalie, and by Mr. Thwaites at Gongama on the lower Badulla Road. It might be a puzzling question to ask *how* and *why* this tiny and peculiar fern is found " throughout India, especially in the Peninsula, Ava, Ceylon, Arabia, Upper Egypt, Abyssinia, Mascaren Isles, Zambezi-land, Macalisberg, and Angola." Baker. I have collected specimens of this fern near Gongama since the above was written.

Tribe. 10 Aspidieæ.

110. Aspidium (Polystichum) auriculatum, Sw.

Bed. 1. t. 120, and 11. t. 136. This is a common Fern on the banks

of streams and in rich damp soil in the forests of the interior, but it is very difficult to get a frond of it that is not eaten by insects, or otherwise imperfect. It is not unlike some of the Aspleniums in general appearance, but the sori are quite different.

111. Aspidium (Polystichum) aculeatum, Sw.

Bed. 1. tt. 121-2, and 11. t. 136. C. P. 1367 for the large and very common normal form, 3503 for a more delicate form, and 3275 for the delicate form called, *biaristatum,* Bl. This is a common fern in the Forest above Maussa Kellie, Kallibokka, and elsewhere in Ceylon. Found "throughout the world ; rare in the Artic regions and Eastern N. America."—Baker.

112. Aspidium (Polystichum) anomalum, Hk. and Arnt.

Bed. 11. t. 219. This is one of the most singular ferns in the world, from the fact that it bears its sori on the upper side of the frond. Peculiar to Ceylon at the Horton Plains and in Happutella, at an elevation of 5,000 to 6,000 feet. With the exception of the anomalous circumstance of the sori being on the upper side of the frond it is otherwise nearly identical with A. (P.) aculeatum.

113. Aspidium (Polystichum) amabile, Bl.

Bed. 1. t. 109. This was an abundant fern in the Forests beyond the Lindoola Patnas some years ago. It is easily distinguished from any other of this genus found in Ceylon. It seems a common and abundant fern in the higher forests of the interior,

114. Aspidium (Polystichum) aristatum, Sw.

Bed. 1. t. 101. figure A? and 11. t. 261, all except the erect caudex of A. (P.) coniifolium, Wall. This one and the next one seem to have got a good deal mixed up. Thwaites distributed the two under his C. P. 1373, but afterwards, believing the two to be quite distinct, separated them, and put C. P. 3937 to A. (P.) aristatum, with a "*creeping caudex,*" and C. P. 3938 to A. (P.) coniifolium, Wall. with an "*erect caudex.*" Beddome's principal figure in 1. t. 101 is said to be for 114 and 11. t. 261 for 114/1, but judging from all the specimens before me, he appears to have entirely reversed them. A very fine specimen with a long creeping caudex, finely cut frond, of a light grey color, the caudex and lower part of the stipes covered with long scales, and the rachis slightly hairy, received from Beckett some years ago, and named by him, agrees with my specimens of 114 collected in Lady Horton's Walk near Kandy. Its creeping caudex, and long hair-like scales, if constant characters, are quite sufficient to separate this one from the next one. It seems to be a rare fern compared with 114/1 which is on the other hand one of the most common ferns in the forests of the interior. Moore and Houlston, Gardener's Mag. of Botany 3. p. 320, assign to both a *creeping caudex,* but otherwise seem to join the Syn. Fil. and Beddome in reversing the descriptions. I feel confident that all these authorities differ from Thwaites and Beckett, and I suspect that these latter gentlemen are correct, but see my remarks on the next one.

114/1. Aspidinm (Polystichum) coniifolium, Wall.

Bed. 1. t. 101 ? for the principal figure, and 11. t. 261 for the erect caudex ? Beddome's figures as thus quoted by me, agree better for all the specimens before me, named by Thwaites and Beckett, but if those gentlemen have wrongly named these two ferns, then my references to 114 and 114/1 must be transposed. In a printed list agreeing with the packets in my own collection, I left out this fern, but I now believe it to be distinct from the other. On a fine specimen of 114/1 received from Beckett some years ago and numbered 150 of his collection, he has made the following note:—"Aspid is Polystichum) coniifolium, Wall. Baker calls this only a umvariearitaty of A.)

tum, from which it is quite distinct. Caudex erect." Beckett's specimen is a shaggy fern, the lower part of the stipes is covered with a dense mass of lanceolate rather broad scales, which gradually decrease in size upwards, till on the upper part of the stipes and rachis they look like rough hairs. The fern is otherwise a coarser one in all its parts, the divisions of the frond being much less finely cut, whilst in a dried state it generally is of a dark bronze color, whilst 114 is generally of a light grey color. The difference in the caudex and in the size of the scales seem to be the best characters for separating these two ferns. This fern is, without exception, the most common one in the forests of the interior, and is always to be had in fruit, and easily dried. Bed 1. t. 103 for Lastrea sparsa, is a better figure for 114/1. It is not a good one for 124. The C. P. 3286 given as a variety of 116, below is exceedingly like this one in nearly every respect, but it is opaque, and the smaller divisions of the pinnules are not aristate. These are good distinctions.

115. Aspidium membranaceum, Hk.

Bed. 1, t. 243. This is the only real Aspidium found in Ceylon. I first found it in the edge of the Forest at the top of the Hoolankande Estate Kallibokka at an elevation of about 4000 feet, and next on a mass of Cabook quite close to the sea at Mutwall, Colombo. It is a delicate handsome fern and a great favorite in cultivation. It is no doubt the fern described by Moore and Houlston as Lastrea elegans, in Mag. of Bot. 3. p. 318 where they say it was introduced to Kew by the late Dr. Gardner. In a Supt. to the Flora of Hongkong, by Dr. Hance, in the Linnean journal v. 13. p. 142. he says that this fern is the Aspidium devexum, Kunze, but Baker does not refer to this name. I used to think that certain plants indicated very distinctly certain elevations in Ceylon, but I now find that plants like this one and 147, Nephrodium (Sagenia) decurrens, are found at high elevations and next close to the sea shore. I found this latter fern in abundance close to the sea shore at Barberyn.

116. Naphrodium (Lastrea) Walkeræ, Hk.

Bed. 1. tt. 234-5. The different forms of this curious fern seem to be common in Saffragam, and near Hewissa. It is described in the Syn. Fil. p. 305 as Polypodium (Phegopteris) Walkeræ, but at p. 455 it is stated that specimens received from Dr. Thwaites shew this to be a Nephrodium. It can scarcely be the N. (L.) cuspidatum, described in the Syn Fil. p. 260, and said (erroneously) to be from Ceylon. For this very variable fern Thwaites has three C. P. numbers and in reference to the last one, C. P. 3286, referred to at 114/1 N. (L.) coniifolium, he has the following remarks,' En. p. 394 :—" Forma c. frondibus bi-tri-pinnatis an species distincta, ? " and again, " Var. c. although very closely allied to the other two varieties, and, in some instances hardly to be distinguished from var. b. except by its more composite structure, is probably specifically distinct, the fronds assuming a different tint of brown when dry." This fern looks like a connecting link between this species and 114/1. above.

117. Nephrodium (Lastrea) hirtipes, Hk.

Bed. 1. t. 96. A common fern in damp forests of the interior, most difficult to find perfect fronds that are not eaten by insects. Beddome's figure is not a good one.

118. Nephrodium (Lastrea) calcaratum, Hk.

Bed. 1. tt. 105 and 246. The larger form of this fern is a most common one in the forests of the interior, and the shining lead color of its sori and the under side of its fronds, is referred to at 94, Asplenium (Athyrium) macrocarpum. It is one of our most variable ferns " but the extreme forms pass insensibly into one another. " The small narrow form figured by Bed 1. t. 246. is found in great abundance on the banks of a stream in the Kotawa forest, about 10 miles from Galle.

119. Nephrodium (Lastrea) Beddomei, Baker.

Bed. 1. t. 110. This is an abundant fern in gullies on the right hand side of the road in the Neura Eliya Plains on the way to Hackgalla, and found in company with Lindsaya cultrata No. 40. It was figured by Beddome as Lastrea gracilescens, but it is quite distinct, and peculiar to Ceylon.

120. Nephrodium (Lastrea) prolixum, Baker.

Bed. 1. t. 107, not good, for the variety *tylodes*, with the sori in a line close to the midrib. A small form of this fern is very common on the banks of streams in Maussakellie, large ones found more sparingly in the edges of jungle in the same place, and near Mattakellie, Dimbula. Baker remarks:—" Dr. Thwaites regards *tylodes* and *ochthodes* as probably distinct species. The two are figured by Beddome tt. 106-7." There can be no doubt that Thwaites, Baker and Beddome have mixed up several species under the names *tylodes* and *ochthodes*. Bed. 1. t. 106 for *ochthodes*, is surely a form of N. molle, and Thwaite's C. P. 975 for *ochthodes*, is the true N. extensum Bl. or Hk. said in the Syn. Fil. to be figured by Bed. at 1. t. 85, which is also more like N. molle. The true N. extensum Bl. is well figured by Bed 11. t. 131. as Nephrodium punctatum, Parish, and I had the pleasure of pointing this out to Major Beddome from a living specimen grown by me in Colombo. Major B. said there could be no doubt of this, and attracted my attention to the fact that this fern connected the Lastreas with the true Nephrodiums. See my notes on 138 N. extensum. We do not seem to have any form of this fern in Ceylon except the C. P. 1361 for var. tylodes, of Kunze, with the sori close to the midrib, and a prominent gland beneath the bases of the pinnæ. I have already shown that the C. P. 975. quoted for the var. ochthodes, is the true N. (L.) extensum, figured by Beddome as N. punctatum, and for which Baker quotes Gardners No. (1362) which is given by Thwaites as equal to C. P. 975. En. p. 392, whilst the two very marked forms of ferns given by him for extensum, are shown to be both for N. (L.) amboinense. Beddome's 1. t. 106 quoted by Baker for N. (L.) prolixum, is a very fair representative of a common Ceylon form of N. (L.) molle, and the principal figure in 1. t. 107, is also more like a form of the same fern than our Ceylon form of N. (L.) tylodes.

The hairness shown on this figure is a contradiction of the description in Syn. Fil. " rachis and under side nearly naked." The figure of the fertile pinnules in the left upper corner of Bed. 1. t. 107 is however a good one. With reference to the confusion in respect to the synonyms of this and other ferns I would strongly recommend writers on Natural History not to take a single statement or reference by previous writers forgranted as correct. The Naturalist if possible should verify every statement made by a reference and careful examination of the specimens referred to when to be had.

121. Nephrodium (Lastrea) syrmaticum, Baker.

Bed. 1. t. 108. A well marked and distinct fern. Found in abundance in the forest separating Ooduwella from Kittulamulla below the zigzag in the middle path where poor Morgan, a young Englishman was shot by Natives some years ago. In drying this fern, the pinnæ generally separate from the rachis as they do in Polypodium (Drynaria) quercifolium, and some others, just as if they were cut off by a knife.

122. Nephrodium (Lastrea) Filix-mas, Rich.

Bed. 1. tt. 111, 112, 113, 114, and 115. This is evidently a rare fern in Ceylon, and confined to the higher forests near Neura Elliya &c.

The only Ceylon specimen I have seen of it is the variety b. C. P. 1364. for which Bed. 1. t. 111. is a pretty good figure, only that the pinnæ on the C. P. specimen are *alternate* whilst on Beddome's figure they are shown to be opposite. After the description of t. 115 Beddome remarks:—" The above 5 species belong to the Filix-mas group of Lastrea, and probably few Botanists

would agree as to what are distinct species, and what varieties only. Sir William Hooker considers them all (even the last) as only varieties of the European " Lastrea Filix-mas" " Habitat, a and b throughout Europe and Asia, from Lapland Japan and the Malay Isles, ascending in the Himalayas to 15,000 feet; Madeira, Sandwich Isles; America, from Greenland along the Rocky Mountains and Andes to Peru," Baker.

123. Nephrodium (Lastrea) flaccidum, Hk.

Bed. 1. t. 250. This is a delicate, flaccid, fern, found only in the edges of the damp forests in the more elevated parts of the Central Province. It has an *erect* caudex, and is only simply pinnated, whilst 134, N. (L.) setigerum, with which Beddome compares it, is a very common fern from the sea coast upwards, has a creeping caudex, is a large bipinnate fern, with often a silvery look about it and the involucres very rarely to be found out it. See my remarks on 134.

124. Nephrodium (Lastrea) sparsum, Don.

Bed. 1. t. 103. not good, and 1. t. 248 good for the form *deltoidea* of Beddome. This is one of the most variable and most abundant of our Ceylon Ferns in the highest parts of the interior, and like most other plants, varie in size and appearance according to soil and exposure. Every form of it seems to dry well and make nice herbarium specimens.—Bed. 1. t. 103 in its general outline is a good figure for the normal small Ceylonese form of this fern, but the distinct aristate and mucronate divisions of the pinnules shown in the figure po not exist on our Ceylon one, and are in fact a contradiction to the description which says that, " the secondary pinnæ are ovate, or ovato oblong *obtuse*" " in the lower half with *rounded obtuse entire lobes.*" Beddome's description "Lowest pinnules sometime compound the others lanceolate, unequal-sided, pinnatifid, with oblong, *blunt lobes.*" Baker. In fact as far as the aristate divisions of the pinnules are concerned, Bed. 1. t. 103 is better for Aspidium (Polysticlum) coniifolium than for this fern. The very remarkable fern discovered by Mr. Beckett first on the top of the Wattakellie mountain, with a zigzag frond looks very distinct from this fern, but the forms of it found lower down on the hill so run into this one, that I should suspect the flexuose rachis to be an abonormal state of this variable fern, and caused perhaps by cold and great exposure. Some of the largest and most divided specimens of N. (L.) sparsum which I collected, were from the belt of forest above upper Wariagalla, in a stream crosssing the Bridle path leading to Kandy, and I beg to thank Mr. Allan Black, then of Kittoolamoola, for the pleasant trip I had to this spot, and for the trouble he took in drying my specimens of this fern and of Pteris patens, in very damp weather.

125. Nephrodium (Lastrea) undulatum, Baker.

Bed. 1. t. 71. This remarkable fern was first discovered by J. W. N. Beckett, F. L. S. on the top of the Wattakellie hill, one of the long parallel ridges in Kallibokka. It was first described and named by Thwaites. Baker says of it:—" Perhaps not distinct from the last, with which it agrees, except in the peculiar zigzag rachises." The fertile fronds of this fern form a series of zigzags and the pinnæ spring *downwards* from the rachis, and in an exact line with one of its bends, and are also undulated, but the barren fronds, and those which grow on the lower parts of the hill, run into N. (L.) sparsum. I shall never forget the night ride from Maussa kellie to Allacolla, and from thence next day to the flag staff on the Trig station on the top of Wattakellie, in search of this fern and other Botanical rarities in company of A. H. T. We entered the forest very shortly after 6 o'clock A. M., and collected upwards until close upon 1 o'clock P. M., when we had breakfast in a beautiful little spot sheltered by detached masses of rock, at an elevation of 5,000 to 6.000 feet, where the cold and the sight of lots of Buttercups and Violets growing close to us, reminded us of our Native land! None but those similarly situated can conceive the pleasure of breaking a long fast under the peculiar circumstances. The

Beer and other viands were cold and delicious, and no merrier laugh was ever re-echoed, on the top of a Ceylon mountain, than on this occasion amongst the Buttercups and violets.

126. Nephrodium (Lastrea) deparoides, Hooker.

Bed· 1. t. 104. This is a beautiful fern, and can scarcely he confounded with any other Ceylon one. "It has very distinct teeth on which the sori are quite terminal, so the plant resembles *Deparia*, a character quite unique in the genus." I found this fern in abundance in company with 150 N. (Sagenia) simulans, and 200, Tœnitis blechnoides, in the Kottawa forest, about ten miles from Galle.

127. Nephrodium (Lastrea) thwaitesii, Baker.

Bed. 1. t. 124. This fern was found by Thwaites in the Singhe-rajah forest, and described by him as Aspidium (Lastrea) concinnum. Beddome's figure shows the sori on the pinna and on the enlarged pinnule to be well in from the margin, whereas the sori are "*quite marginal.*" The figure is not otherwise good for C. P. 3798. Thwaites, remarks indicating its distinctness from N. (L.) sparsum (124) are thus qualified by Sir Wm. Hooker:—A. sparsum Spr. A. purpurascens Bl. is very variable, and some of my specimens have the sori very near the margin.

128. Neprodium (Lastrea) odoratum, Baker.

Bed. 1. t. 95. As Lastrea eriocarpa, Decaisne, I know nothing of this fern except that Mr. Wall includes it in the list referred to in my introductory notes as a Ceylon one. In his published Catalogue he states that it was discovered by Beckett on rocks on the Eastern ranges of the Central Province.

129. Nephrodium (Lastrea) recedens, Hk.

Bed. 1. t. 98 C. P. 1374. Not an uncommon fern in the Central Province. In the jungle adjoining Lady Horton's Walk and elsewhere. This fern and 131. N. (L.) intermedium, are so like each other in size cutting, and their dark brown color, in the herbarium, that I found my specimens of the two mixed up:—Why 130 should come in between I do not know, it is very unlike either of them.

130. Nephrodium (Lastrea) membranifolium, Presl.

Bed. 1. t. 102. This fern is so like 151, in size and general appearance when growing and in the dried state, that I found them mixed up in my collection. The free veins of this, with the forked veins in the sinus of the lobes, and the netted veins of N. (Sagenia) gigantea, will enable the collector to separate them with ease however.—No. 130 though an alpine fern will grow freely in Colombo. It is very unlike 129 and 131 though it comes in between them.

131. Nephrodium (Lastrea) intermedium, Baker.

Bed. 1. t. 249, C. P. 3059. A good deal like 129 in a dried state. The involucre is so fugacious that it is rarely seen on the old specimens of this fern, and it is therefore very like a Polypodium. See my remarks on 129. This is evidently a rare fern in Ceylon compared with 129. I found it in abundance in the reserved piece of Forest belonging to the Holywood Estate in Dimboola.

132. Nephrodium (Lastrea) obtusilobum, Baker.

Bed. 11. t. 296. "Hab: Ceylon, Dr. Thwaites, C. P. 3142. Most like *N. intermedium* in size and cutting, but the scales different, the under side very glandular, and the texture thinner." Baker. In the C. P. numbers now before me, and in my own specimens of these two ferns, the dark brown color of both is much the same, but the cutting seems very different as seen on the specimens and on a reference to Beddome's figures. N. obtusilobum, is a good deal like old specimens of Davallia Speluncæ in cutting. Found on the Horton Plains and the higher ranges, and at Neura Elliya.

133. Nephrodium (Lastrea) Boryanum, Baker (non Hk.)

Bed. 1. t. 97. My specimens of this fine fern were procured from the edges of forest adjoining a clearing in Lindoola, and it is so like plants of Davallia Speluncæ No. 38 that I took it to be this fern until I looked at the sori. When well dried it retains a great deal of its green color in the herbarium.

134. Nephrodium (Lastrea) setigerum, Baker.

Bed. 1. t. 99. and 171 ? See my notes on 123, N. flaccidum. The present one is a very common fern from the sea coast to the Central Province, has a large compound frond, with a wide creeping rhizome, and has a very peculiar glaucous color. It grows very readily, and with Davallia Speluncæ is very commonly cultivated in Colombo. The involucres are very seldom found on this fern, and hence it has been described as different species of Polypodium by different writers. Plants exposed to the sun curl up and do not make good specimens, which should be collected from good plants in a shady place, and put under considerable pressure to prevent their curling up. Specimens are liable to the attack of insects if not poisoned. "Major Beddome considers Polypodium ornatum Wall (1. t. 171.) as a distinct plant, distinguishable from this by its erect caudex, and the constant absence of an involucre." Baker.

135. Nephrodium Otaria, Baker.

Bed. 1. t. 83. This seems to be a very distinct and rare fern, found in Bintenne by *Gardner* and in company with Actiniopteris radiata, Adiantum lunulatum, Polypodium (N.) lingua, and Aspidium membranaceum (109, 46, 174, and 115) which are all rare ferns, at Gongama, on the lower Badulla road, or a short distance beyond it, and at Pittawella village by Beckett

136. Nephrodium unitum, R. Br.

Bed. 1. t. 89. This is a very common fern in the low country, growing on the edges of drains, fields or swampy places ; it is very abundant between Jaella and Dondagam, and on both sides of the road between Hangwella and Sitawaka. It is a good deal mixed up in nomenclature with 139, now N. cucullatum of Baker, but the two ferns are quite different, the latter one being a stiff rigid fern compared with N. unitum.

137. Nephrodium pteroides, J. Sm.

Bed. I. t. 90. This is not an uncommon fern near Colombo and at Porey. I collected very fine specimens beyond the Budhist Temple on the roadside to the top of the Kurnegalle rock. It is easily distinguished from the next one, The sori are on the points of the divisions, hence one of its names, N. terminans.

138. Nephrodium extensum, Hk.

Bed. 11. t. 131. figured as N. punctatum, Parish. Baker quotes Bed. 1. t. 85. for this fern, but it is most unlike it, and is surely for N. molle ? This is C. P. (1362) Gardner's specimen, and C. P. 975 ; and is given in En. Pl. Zeyl. p. 392 for N. ochthodes, a form of N. prolixum. The plants C. P. 3391 and 3498 which Thwaites gives for N. extensum, Bl. is 140, N. Amboinense, Presl. but see what I have said at 120 N. (L.) prolixum. 138 is very abundant on the sides of drains at Galle, near Beruwella (Barberyn) on the road side. "This is joined to the preceding by Mettenius. The texture is more herbaceous, and the lobes are much narrower and deeper, with a considerable space between them." Baker. This fern connects the sections Lastrea and Nephrodium.

139. Nephrodium cucullatum, Baker.

Bed. 1. t. 88. as N. unitum, which is now 136. These two have been a good deal mixed up and confounded with each other. 139 is a common fern in the Western Province in the same places as 136, but it is one of the most

conspicuous ferns of the interior. It has a wide creeping rhizome, and can be seen growing on the sides of the moist cuttings on the Kaduganava incline, and together with 71, Blechnum orientale, is one of the most common ferns seen in gullies, or overhanging cuttings on all the road-sides of the Central Province, its large feathery fronds curving over gracefully and concealing every other plant. When it grows in dry soil and exposed it is a stiff rigid one compared to 136. The N. Haenkeanum, Presl. 171. p. 290, of Syn. Fil. given by Baker as a *Ceylon* fern, must be a mere form of this one. Baker says, it is "much larger and less hairy than N. cucullatum, with more numerous veins, and a very fugacious involucre." If this fern is really distinct from 139, there is evidently a mistake in saying it is found in Ceylon.

140. Nephrodium amboinense, Presl.

Bed. 11. t. 201. for C. P. 3391. See my notes on Nos. 120 and 138. This is more like a small herbaceous form of the next one, N. arbuscula, than any other Ceylon fern, and is most distinct from any form of N. extensum. Beddome says it only differs from the ordinary form of N. extensum in its smaller size, &c. but the fact is that the true N. extensum is "cut about two-thirds down to the rachis into linear oblong-lobes," with the "sori always nearly terminal in the lobes," whilst this one is cut only "about a quarter down in bluntish slightly falcate lobes," and has "the sori in rows *close to the midrib.*" The C. P. specimen before me has only serratures along the pinnæ. It must be a rare fern in Ceylon. It is found in the Uva district, C. P. 3498 is no doubt the large form of this fern.

141. Nephrodium arbuscula, Desv.

Bed. 1. t. 87. This is a very common fern on the banks of streams or rivers in the Central Province, and in wet swampy ground. Very old plants of it have a trunk like caudex, with the remains of the fallen fronds around. See my note on the last one.

141/1. Nephrodium abortivum, J. Sm.

Bed. 11. t. 136. C. P. 3064 for N. eusorum, Thwaites. In my list I have this fern down thus :—"(Not in Ceylon?)" This one, 142, N. pennigerum, Hk. and 144, N. truncatum, Presl., are all three given in Syn. Fil. as natives of Ceylon. The synonyms of 142, and 144, are so completely mixed up in the works before me, that I dare not attempt to separate them, but I am now fully convinced that 141/1 is a Ceylon fern, and that 144 is not so. The description of N. abortivum in Syn. Fil., and the full one given by Thwaites in En. Pl. Zeyl. p. 391, No. 25 for C. P. 3064 N. eusorum, Thw. so completely agree, that there can be no doubt they are meant for the same fern. Beddome's figure above quoted is one of the worst in his works, the sori are shown *close* to the main vein on his enlarged figure ; and actually *touching* it in the other, and the lobes of the pinnæ are shewn to be serrated and toothed, and somewhat falcate, whereas the sori are very nearly *medial*, and the lobes are generally cut about ⅓ to ½ way down and are close, *entire, truncate.* The sudden reduction of pinnæ into mere auricles so well described by Baker and Thwaites is a most marked character of this fern. All my specimens are of a fine green color, and of a thin herbaceous texture. It is separated readily from 142, by the anastmosing of only about 1 to 2 pairs of the lower veins whilst in 142, 3 to 6, never less than 3 anastmose. I found this fern (141/1) at Sitawaka, and fine large specimens of it in the belt of forests through which the main road passes a little beyond Craigie Lea near the Devon Falls, Dimbula.

142. Nephrodium pennigerum, Hk.

Bed. 1. t. 86. as N. abruptum, Presl. The Syn. Fil. quotes Aspidium muttilineatun, Wall. and N. articulatum, Moore, J. Sm. now both these are given by Houlston and Moore as natives of Ceylon. Gardner's Magazine of Botany 3. p. 293 Nos. 1 and 5, respectively. No. 1 is said to be "an ever-

green stove fern from India and Ceylon," with "venules all anastomosing, forming lines between the primary veins (hence the specific name) dividing the whole surface of pinnæ into rectilinear paralellograms" and of No. 5 it is said :—"This species has been six years in cultivation, and was sent to Kew by the late Dr. Gardner." There can be no doubt, I think, about this being the C. P. 3271 for which Thw. quotes A abruptum Bl. and therefore no fern has as far as I know been found in Ceylon for 144. N. pennigerum is always a more rigid fern in a dried state than 141/1, and of a dark brown color. It must be a very rare fern in Ceylon compared with the other. My few specimens of it are from Kalliboka.

143. Nephrodium Molle, Desv.

Bed. 1. tt. 84, 85 ? and 106, and 11. t. 200 good. This is one of the most common and most abundant of our Ceylon Ferns from the coast up to the higher parts of the interior.—Though I have put a ? after Bed. 1. t. 85 as N. extensum, and Bed. 1. t. 106 as Lastrea ochthodes, I think there can be little doubt that these figures are for N. Molle. One of the sections for this genus is given in the Syn. Fil. thus p. 218.—* * "Fronds large pinnate ; *rhizome wide-creeping* Sp. 159—176." And another page 291, thus:—"* * * Fronds large, pinnate ; *caudex, erect*, or *suberect*, Sp. 177 196," this latter includes N. molle, now the fact is that it is one of the most commonly cultivated in Ferneries in Colombo, and its *wide creeping* habit is such that it generally runs over the whole space and smoothers the more delicate ones. This fern and Nephrolepis acuta, and exaltata, are the three most commonly cultivated in pots and in Ferneries in Colombo, and if allowed they soon kill every other kind.—Baker, Syn Fil. page 290 No. 199 says that N. procurrens, Baker is very "like *N. molle*, but distinguished by its *creeping rihizome*," but this is no distinction,—and again after No. 188 page 293 *N.* heterocarpum, Moore, he remarks:—"Very near some of the forms of N. *molle*, but less hairy, and densely glandular beneath, with the lower pinnæ suddenly dwarfed," characters equally common for some of our Ceylon specimens. N. molle is very liable to be eaten by insects unless poisoned, and all the species of the group are liable to a white blight beneath, caused by insects which plough through the sori. Specimens should therefore be collected with care and poisoned as soon as they are dry.

144. Nephrodium truncatum, Presl.

Baker in the Syn. Fil. 194 quotes *N. eusorum*. Thwaites as a synonym for this fern, and states it is a native of North India and Ceylon ; but I feel convinced that N. eusorum is identical with 141/1 N. abortivum and that we have no fern in Ceylon to agree with N. truncatum, Presl. of the Syn. Fil. which is said to have the "*veins* pinnate in the lobes, with 6—8 veinlets on a side with a *sorus* on each *near the main vein*."—141/1 and 142, Are said to have sori *medial* on the veins, and all the specimens I have seen have them so. The C. P. 3,271 is given for N. abruptum, Presl. shown to be a synonym of 142, if Baker be correct in quoting the synonym of this species. N. pennigerum Hk. and N. truncatum, Presl. of the Syn. Fil. do not exist as separate ferns in Ceylon.

145. Nephrodium (Sagenia) subtriphyllum, Baker.

Bed. 1. t. 242 good and 11 t. 48 for large Indian form. This is a handsome little fern said to be found in the forests of Allagalla and Matura. It is evidently a rare fern ; grows freely in pots in Colombo.

146. Nephrodium (Sagenia) polymorphum, Baker.

Bed. 1. tt. 116 and 117. This is a very distinct fern from any other Ceylon one. Common in the Central Province generally on the banks of streams and under the shade, and in rich soil near stones and rocks.

147. Nephrodium (Sagenia) decurrens, Baker.

Bed. 1. t. 82. This is a fine fern and not uncommonly cultivated in Colombo. It is a common fern near Barberyn close to the sea shore, and in rich moist soil in well-shaded places in the Central Province. I found it some years ago in the old fort ditch, at the Hangwella Rest House, but it seems to have been extirpated from this place. It cannot be confounded with any other fern that I know.

148. Nephrodium (Sagenia) decurrens, var. minor, Beddome.

Bed. 1. t. 245. This seems to be a remarkable form of the last one, or a distinct species. In. En. Pl. Zeyl. Addenda. &c., p. 438 under C. P. 3,808 Thwaites after giving a short description of this fern puts the following question :—"Hab. Peradeniya amongst plants of *Aspid*: *pteropus, Kze,* (N. decurrens) var. a, and *Acrostichum quercifolium.* Retz. Can it possibly be a hybrid between these to species, bearing as it does, a certain resemblance to the latter?" Here then is the question whether two genera of Ferns, pretty widely separated by marked characters, have not produced a hybrid partaking to some extent of the character of both? Here is my note on this fern—"Common on sides of old road from the 36th mile stone to Beruwella (Berberyn) mixed with N. (S.) decurrens, and A. (G.) quercifolium. It is a well marked form with narrow fertile fronds, quite common on cabook cuttings." The following is Mr. Wall's note on this fern :—"Nephrodium (Sagenia) decurrens *var.* minor is a curious plant, bearing a distant resembleance to Acrostichum quercifolium? with which Dr. Thwaites thinks it may be a hybrid. It would seem more probably one between decurrens and subtriphyllum, closely allieds pecies to both of which it bears a resemblance," But I have shown above that it is found at Barberyn, where subtriphylum does not grow. My own opinion is that it is just an abnormal form of decurrens, and no hybrid.

149. Nephrodium (Sagenia) cicutarium, Baker.

Bed. 1. t. 81. This is a handsome, thin, delicate fern, evidently rare in Ceylon. Found at Rambodde in the South West Monsoon :—"This includes all the *Eusageniœ* (six species) of Moore's Index. The extremes differ in size very much, but all the forms appear to agree in sori and venation.' Baker.

150. Nephrodium (Sagenia) simulans, Baker.

Bed. 1. t. 244. for C. P. 3,331, given in En. Pl. Zeyl. as a variey of the last one.—It is a well marked species with "the stipes, rachis, and costa beneath ebeneous glossy," and stiff fronds, quite distinct from any other Ceylon fern. It is in abundance in the Kottawa forest about ten miles to the Eastward of Galle,

151. Nephrodium (Sagenia) giganteum, Baker.

Bed. 1. t. 80. This as its name implies, is a tall fern. It is found in abundance in rich soil in gullies in the forests of the interior. It is so like 130 when growing that it is difficult to distinguish them except by looking at the veining. This fern grows freely in Colombo.

152. Nephrolepis cordifolia, Baker.

Bed. 1. t. 92. This is a handsome fern found only in the higher parts of the interior, and like the next two species most difficult to dry. The pinnœ almost invariably fall off them. One of the names for this fern. N. tuberosa, is very good for it, as it is remarkable for bearing tubers on its wiry fibres. It grows in Colombo but seldom bears sori.

153. Nephrolepis exaltata, Schott.

Bed. 1, t 93. This and the next one are two of the most common ferns in wet swampy places in Ceylon, and both when supported by grass

or jungle, grow to a great length, and often struggle up to a height of eight to ten feet. Together with 143, Nephrodium molle, they are the most commonly cultivated ferns in Colombo- Once they take root they spread over the ground or grow in pots and kill every thing else if they are not looked after. There are perhaps about half a dozen people in Colombo who take the trouble to cultivate other ferns besides these miserable ones.

154. Nephrolepis acuta, Presl.

Bed. 1. t. 94. Most common, and in the same places as the last one. They are very like each other, but are distinct and easily made out. This one if anything is more difficult to dry than the last one. See my notes on it.

155. Nephrolepis ramosa, Baker.

Bed. 1. t. 251. This is a common fern, climbing on the trunks of trees in the forests of the interior, sometimes to a great length, but very seldom in fruit. Fine specimens of it on the top of the ridge separating Galaha from Hinguru-galla, and on the banks of the Agra Oya.

156. Oleandra musæfolia, Kunze.

Bed. 1. t. 91. This is a very handsome fern found creeping on rocks or growing in vegetable mould, in crevices of rocks, in the higher part of the interior. We have no other fern in Ceylon that it can be confounded with.

Tribe 11, Polypodieæ.

157. Polypodium (Phegopteris) distans, Don.

Bed. 1. t. 168 and 11. t. 39. It's other name, P. Paludosum, is a good one, as it generally grows in swampy wet places. On the banks of the river between Middleton and Mattakellie, Dimbulla, and the edges of streams in the Nuwara Eliya plains, where it is found in abundance, exposed to the sun, it is a stiff erect and somewhat rigid plant, but in shade and in fine soil close to the Mattakellie bungalow I found some fine plants from seven to eight feet in height, and very different in aspect from the others, but when once examined carefully it is easily recognised. Its stipes is not *slender* as stated in Syn. Fil

158. Polypodium (Phegopteris) rufescens, Blume.

Bed. 1. t. 236. This is a common fern in the forests of the interior. I found it above Galaha, LeVallon, and near Mattakellie, Dimbula, in abundance. It is easily recognised.

159. Polypodium (Phegopteris) punctatum, Thunb.

Bed. 1. t. 170. This is a very abundant fern in neglected gullies on coffee estates, along the sides of streams, in swamps, and very often in patanas in edges of forests in company with Pteris aquilina, which it much resembles in general aspect as remarked by Beddome; but its hairy viscid fronds, its cutting and fruit, will at once distinguish it from any other of our Ceylon ferns. Moore and Houlston describe it as *Hypolepis rugulosa*, and after H. Purdiana, Hk. at p. 130. Syn Fil. the following remarks are made :—"I give this and the six preceding species with great doubt as to how far they are distinct from one another, and with a suspicion that some of them at least, like other plants which have been placed in *Hypolepis*, will prove not really distinct from *Polypodium rugulosum* (P. punctatum). With regard to the present one, for instance, Dr. Griesbach writes (Flora Brit. West Indies, p. 67). "Not to be distinguished from *P. rugulosum* but by the specially transferred involucral appendages, and probably passing into that widely-ranging species." Sir W. Hooker has expressed the same doubt with regard to *H. distans*; and reference may be made also, in connection with the same point, to Dr. Hooker's remarks in the Floras of New Zealand and Tasmania. Specimens now before me from Ceylon, Brisbane, New Zealand, and Victoria, differ very much in several respects, but no doubt this is caused by the difference of climate, &c.

The Brisbane specimens bear a general resemblance to 134. N. setigerum, the specimen from Victoria has the "deep purplish brown and densely viscid rachis" of the var. *P. rugulosum,* whilst a specimen from New Zealand marked *Hypolepis distans,* does not differ from this last one, except in the *light color* of its rachis.

160. Polypodium (Goniopteris) urophyllum, Wall.

Bed. 1. t. 239. "Forest of the Central Province not uncommon" Thwaites En. p. 394. Found in forest near Kitoolamulla, and Uduwella, but evidently a rare fern. At. II. t. 133, for Nephrodium lineatum, Beddome remarks, "It is almost exactly similar to Goniopteris urophylla, except that it is always indusioid as Sir W. Hooker observes, it is very startling how some ferns of the *Aspidioid* group exactly resemble others of the tribe *Polypodium,* the presence or absence of the indiusium being almost the only distinction." And again at 11. t. 220 for Nephrodium costatum, he observes, "If the Ceylon fern (1.t. 230) is found to have involucres it cannot be separated from Nephrodium lineatum, Presl. (11. t. 133.) My Ceylon specimens of Goniopteris urophylla (though young and good) show no trace of an involucre, but it is very distinctly visible in my Himalayan specimen of Nephrodium lineatum, there is nothing else to distinguish the two ferns (vide remarks at p. 133) And yet the figures seem very different in many respects. Under P. (G.) urophyllum, Baker says, "this resembles on the one hand Nephrodium glandulosum, and on the other Meniscium cuspidatum, and is very doubtfully distinct from the latter" and again under this latter fern he says, "very probably a Menisciod form of Polyp. urophyllum, with which Hooker united it." If the mathematical axiom, "that things which are equal to the same things, be equal to each other" then I do not envy the Botanist who has to separate or unite ferns like the ones mentioned above.

161. Polypodium (Goniopteris) proliferum, Presl.

Bed. 1. t. 172. At addenda, &c., in En. Pl. Zeyl. p. 439, this one is supposed to be a state of C. P. 3,145, Meniscium Thwaitesii, Hk. 194, but the two are described in Syn. Fil. as distinct ferns. In a note by Mr. Wall in my M. S. list, I see that he puts down C. P. 3,916 for P. (G.) proliferum so that it is a Ceylon fern, though Baker does not state it to be so. I have seen no specimen of it.

Polypodium (Goniopteris lineatum, Colebr. given as a Ceylon fern on the authority of a specimen in the Hookerian Herbarium from the late General Walker, En. Pl. Zeyl. p. 439. is described in Syn Fil. as a Ceylon fern, but no specimen of it seems to have been found in the island by subsequent collectors.

162. Polypodium parasiticum, Mett.

Bed. 1. t. 165. Agreeing with C. P. 3921, marked on the specimen, "Var—latiusculum." I have seen no other specimen of this number. It is not unlike the next one in general appearance, but more coriaceous in texture.

The narrow, and almost glabrous form marked C. P. 1283, seems a common plant in the Central Province, and near Hewissa.

Found growing in moss on the branches and stems of Coffee plants and stones on Hatella and Kallibokka Estates, near Langdale in Dimbulla, and in great abundance on moist rocks along a stream near Hewissa. Those from the latter place have fronds from $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long, and only about $\frac{1}{8}$ in broad, and look very unlike Beddome's figure quoted above. One of my Kallibokka specimens is quite zigzag, and has thrown out an abortive pinna at the angle of each of the bends, but I find that several of the simple fronded and pinnate species are occasionally, either bifurcated or bipinnate, but these must be looked upon as abnormal forms. It is not unlikely that two species are included here.

163. Polypodium hirtellum, Bl.

Bed. 11. t. 172 P. lasiosorum, Hk, and 11. t. 212. C. P. 3902 was found by Mr. Thwaites at Bogawantalawa, at an elevation of 5,000 feet; my speci-

mens are from Morawaka from Mr. Buxton Laurie. It is not unlike the hairy broad form of the last one, but this is less coriaceous in texture, and is a very hairy plant. Beddome has a long note after 11. t. 212, showing how this fern is identical with species of Grammitis, and how difficult it is to separate the species of this group of ferns.

164. Polypodium zeylanicum, Mett.

Bed. 1. t. 237. This fern is peculiar to Ceylon, and found in great abundance on trunks of trees or on rocks in damp forests in the Central Province. It is most difficult to get good entire fronds of it, not more than one in fifty being generally perfect.

164/1. Polypodium mediale, Baker.

Bed. 11. t. 380, as P. Wallii, Bed. This fern was discovered by G. Wall Esq. in the Central Province. "It comes nearest to parasiticum, but is very much larger and of much thicker texture." Beddome.

165. Polypodium cucullatum, Nees.

Bed. 1. t. 233. This is still more common and abundant than the last one and found generally growing in moss and amongst species of Hymenophyllum, and Trichomanes on the trunks of trees in the forests of all the higher parts of the Central Province. It is a very small fern and might be taken for young plants of some other species, the *cucullate* upper lobes of the frond enclosing the large solitary sorus, will enable this tiny fern to be distinguished at once from any of our Ceylon ferns. Its specific name is derived from this peculiarity.

166. Polypodium cornigerum, Baker:

Bed. 11. t. 381. C. P. 4005. A tiny tufted fern its fronds resembling a double-saw, found by Dr. Thwaites in the Horton Plains. The C. P. No. shows that it was discovered after the En. Pl. Zeyl. was published.

(166/1. Polypodium parvulum, Bory, is given in the Syn. Fil. as a Ceylon fern, which it really is not, whilst 171, P. subfalcatum, which is a Ceylon one, is not given as such. See notes on 171, &c. Thwaites formerly called his C. P. 1290 P. parvulum, but corrected this into P. subfalcatum, and he afterwards called C. P. 3900 P. parvulum of Bory, but this is figured by Beddome 11. t. 188 as P. Thwaitesii.) See 170.

167. Polypodium glandulosum, Hk.

Bed. 1. t. 238 fig. B., C. P. 1289. This tiny glandular fern is peculiar to Ceylon, and the following note in Syn. Fil. goes to prove that we have no other fern in Ceylon approaching P. parvulum. "Hab. Ceylon. Perhaps a form of *P. parvulum* with which it agrees in general habit." This fern was found at Rambodde by the late Dr. Gardner.

168. Polypodium obliquatum, Bl.

Bed. 1. t. 167. This is one of the most common ferns growing on the trunks of trees in the forests of the Central Province. It is a coarse fern, and is most difficult to press good specimens of it. It is often found growing with 31, Davallia (Prosaptia) contigua, and a good deal like it in general appearance, but the terminal fruit of this latter will distinguish it at once. Beddome remarks, the fructification of this species which belongs to the genus "Cryptosorus," is very peculiar, it is sunk into oval cavities on the lower side of the frond."

169. Polypodium repandulum, Mett.

Bed. 11. t. 189. B. Baker gives this as a Ceylon fern and quotes for it Gardner's Nos. 1147, and 1290, and Thwaites's C. P. 3900. Gardner's 1147 has no place in En. Pl. Zeyl., and 1290 is now the C. P. No. for P. subfalcatum Bl., whilst C. P. 3900, a very distinct fern, is figured and described by Bed. 11. t. 188. as P. Thwaitesii, whilst Thwaites on the other hand believes that this fern is the P. parvulum, Bory. See notes on 171 below.

170. Polypodium Thwaitesii, Beddome.

Bed. 11, t. 188. good for C. P. 3900. "Caudex creeping, clothed with lanceolate scales, fronds sessile (on all the specimens before me, the fronds have a winged base which gradually decreases until it reaches the caudex, but the figure does not show the *fronds sessile*, W. F.), rigidly membranaceous, perfectly glabeous, 2-4 inches long, 1 inch wide, lanceolate, deeply almost to the costa pinnatifid, segments 3-6 lines long, 1-2 lines broad, sinuato pinnatifid, lower ones gradually smaller, veins pinnate, veinlets simple, or rarely forked, where simple soriferous at the apex or a little below it, where forked the superior veinlet is soriferous."

"I received this specimen from Ceylon where it has just been detected by Mr. Thwaites, who considers it the true P. parvulum of Bory; on comparing it, however, with authenticated specimens of that species from Mauritius, I find that it wants the warty stipes of that plant, the venation is different, and the segments of the frond are generally sinuato-pinnatifid instead of entire. Mr. Thwaites informs me it is very sweet scented."

It will be seen above that Baker quotes this fern, and C. P. 1290 for P. repandulum, Mett. The thick, shaggy, wide creeping caudex of C. P. 3900, separate it from any other Ceylon fern of this group.

My specimens of it are from the Nilambe forests above Le Vallon, and Raxava in Dolosbagie, and I have fine ones from Rakwane from Mr. Buxton Laurie; and in respect to the scent of it, this gentleman and Major Hutchinson agree with me that it has the smell of Rhubarb, or of withering vegetation, but not a pleasant one.

Whether 128, N. (L.) odoratum, is a fragrant fern I do not know, but the notes on 40, Lindsaya cultrata, prove that it is a delightfully fragrant fern when in a drying state.

171. Polypodium subfalcatum, Blume.

Bed. l. t. 166, and II, t. 189 fig. A for the hairy form of this fern, and perhaps II. t. 76, which is said to be an undescribed fern. It would be quite a study to try and disentangle the confusion respecting the nomenclature of this fern, P parvulum, and P. repandulum in Beddome's letter-press, and index. The C. P. 1290 specimens from Peradeniya, and from Beckett, agree for most of those collected by myself, and for Bed. 11. t. 189, B., but I have some specimens of the more hairy form which may be the C. P. 3073 of which I have not seen any specimen. It will be seen from the notes on 169 and 170 that Baker quotes the C. P. 1290 and 3900, for P. repandulum, Mett. evidently a mistake. P. parvulum is given in Syn. Fil. as a Ceylon fern, whilst P. subfalcatum is not, but it is now clear that P. parvulum, Bory, is not in Ceylon, but that P. subfalcatum, Bl. is a common fern growing on the trunks of trees in the forests of the Central Province. See notes on 166/1, 167, 169 and 170. "This includes P. minutum, Syn. Fil. 2nd. ed. p. 328, as far at least as the Ceylon plant is concerned. Beddome.

172. Polypodium decorum, Brack.

Bed. 1. 238. fig. A. good. This is a small handsome fern found in the Singhe-rajah forests and Hinidoon Pattoo by Mr. Thwaites. Found in great abundance on trunks of trees and on stones in forests near Hewissa in a trip in company with Major Hutchinson. (P. minutum, Bl., Syn. Fil. Nos. 151. p. 328, and P. fuscatum, Bl. Bed. II. t. 324, Syn. Fil. p. 331, and both said to be Ceylon ferns, are not known to be so by any Ceylon authority.)

173. Polypodium (Niphobolus) adnascens, Sw.

Bed. 1. t. 184 very bad. Swartz Syn. Fil. t. II. fig. 2 good, in some respects. This fern and 201, Drymoglossum piloselloides, are the most common ferns in Colombo, generally covering the trunks of coconut and other trees, and I notice that coconut trees covered by either of them, seldom bear fruit,

but whether the presence of the ferns is the cause I do not know. They generally grow on thin attennuated unhealthy trees. What the desc. in Syn. Fil. means by stating that the "upper surface of the fronds is *naked* and the lower thinly coated with whitish tomentum in the barren, but more densely in the fertile part beneath," I do not understand, as in all our Ceylon specimens the upper sides of the frond are pretty well covered by stellate pubescence, and the lower ones densely so. Specimens from Mr. J. Bagra from Balangoda, and from the surface of a rock in a stream below Maussakellie, Kallibokka are broad, thin in texture, and somewhat rhomboidal in form, and look very different from the common long linear Colombo form. This is perhaps without exception the most difficult te dry of all our Ceylon ferns. If dried even under great pressure, it curls round into a pipe when the pressure is taken off, the lower side being always outside. The only way to get good specimens of our Colombo one, is to put them in lots of blotting-paper and get a Dhoby to iron them on the upper side until they are quite dry.

174. Polypodium (Niphobolus) pannosum, Mett.

Bed. 1. t. 240. Thwaites says this fern is not uncommon in the warmer parts of the island; and up to an elevation of 3000 feet. My only specimen is from Beckett. Found at Gongama on the lower Badulla road, very like an Acrostichum and so named by Thunberg. "Well marked by its decided stem and comparatively short broad frond," Baker. "Those who are interested in the culture of *Hardy ferns* will be glad to learn, that Niphobolus Lingua succeeds on rockwork in the open air in the climate of Devonshire. It may thus be seen in the nursery of Mr. Prince of Exeter." Gard. Mag. Bot. 3. p. 219.

175. Polypodium (Niphobolus fissum, Baker.

Bed. 1. t. 183. This is not an uncommon fern growing on the sides of rocks in the higher parts of the interior. "It is characterised by its strap-shaped subsessile fronds, very wooly beneath."—Baker.

176. Polypodium (Niphobolus) Gardneri, Mett.

Bed. 1. t. 241. This is not uncommon in the forks of trees and on rocks in the forests of the interior, and varies much in size. Like P. (N.) adnascens, it curls up in drying. This fern is peculiar to Ceylon. "Very like *P. stigmosum* in general habit, but the sori larger and the tomentum thicker." Baker.

(Polypodium (Niphobolus) acrostichoides, Sw. Bed. 11. t. 81 is considered a native of Ceylon on the authority of a specimen from *Gardner*. En. Pl. Zeyl. p. 396.)

177. Polypodium (Phymatodes) lineare, Thunb.

Bed. 1. t. 180. This is one of the most common ferns in the region of the Coffee estates. It is often found growing on stones, trunks of trees, and even on the Coffee plants, in some of the estates. Its simple long lanceolate, and leathery fronds, with two rows of *large* sori, will easily distinguish it from any other fern found in the same localities. It differs much in size according to the exposure and place of growth. Simple fronds of the common Cinnamon Garden one, P. (P.) Phymatodes, are very like this one when they bear fruit. When not in fruit it may readily be confounded with 212, Acrostichum (Hymenolepis) spicatum, Linn.

178. Polypodium (Phymatodes) lanceolatum, Linn.

Bed. 1. t. 181. C. P. 3988. This a rare fern in Ceylon. It is found not far from the Church in the Nuwara Eliya Plains. "Very similar to the last species in outward appearance, the venation however is different, and the under-surface of the fronds is always clothed with orbiculate peltate scales." Beddome.

179. Polypodium (Phymatodes) membranaceum, Don.

Bed. 1. t. 177. This is a very beautiful and very common fern in the forests of the interior growing in rich vegetable mould on the surface of rocks, and on the trunks of trees. Some of the fronds when grown in rich damp places become very large, and are often deeply gashed along their margins, half pinnated in fact.

(Polypodium (Phymatodes) heterocarpum, Blume. Bed. 11. t. 319. Said in Syn. Fil. to be native of Ceylon, has not been found in it.

180. Polypodium (Phymatodes) irioides, Lam.

Bed. 1. t. 178. This is a very rare fern in Ceylon compared with 179. Found at Ettangwella and Halgoda Pass, Matale East, and said to be fonnd near Kurunegala. It is a stiff coriaceous fern compared with the last one. Plants of this one, from the trunk of a tree in the forest near Sitawaka, grow freely in Colombo, and agree for desc. in Syn. Fil.

181. Polypodium (Phymatodes) peteropus, Bl.

Bed. 1. t. 179 for the simple fronded fern, and 11. t. 11 for the tripartite form. Found at "*Muruta*" by Gardner, and in Ambegamuwa district by Thwaites. The tripartite form found in Rakwane by Mr. Buxton Laurie. Grows in rocks in rivers under water. Not very common.

182. Polypodium (Phymatodes) trifidum, Don.

Bed. 1. t. 175. This very handsome and abundant fern, grows on the trunks of trees or on rocks in the forests of the interior, and found as low down as the site of the Labugama Kraal. I have different forms from small trifid ones to others with 9 lobes on a side over-lapping each other, about 1 foot each way. Very fine one on damp rocks on the bridle path leading from Oonoonagalla to the summit of the Hunasgiria Peak. It is said to have an agreeable fragrance of new mown hay when dry, but I have never noticed this peculiarity.

183. Polypodium (Phymatodes) phymatodes, Linn.

Bed. 1. t. 173. This is the very common fern growing amongst the roots of the Cinnamon near Colombo, and elsewhere in Ceylon. It is a very handsome fern, but most difficult to dry. In the hot dry sands in the cinnamon it is often simple fronded and when these bear fruit they are very like 177. P. lineare. I consider this one of the best ferns to grow amongst others in Colombo. "Hab. Polynesian and Malayan Isles and N. Australia to Formosa and Loo-Choo, Tsus-Sima, Ceylon, Mascaren Isles, Natal, Zambesi-land, Angola, Guinea Coast, and Tahite. It is curious that this very common Malayan species should be quite absent from Continental India." Baker.

184. Polypodium (Phymatodes) nigrescens, Bl.

Bed. 1. t. 176. This is a common fern in the forests &c. of the Central Province. It is a much larger fern than the last and turns very dark when dried. It is very liable to rot or to be eaten by insects if it is not poisoned.

185. Polypodium (Phymatodes) dilatatum, Wall.

Bed. 11. t. 122. This fern was first found in Ceylon by Beckett, near Ratotte and elsewhere since by other collectors. I have specimens from Mr Buxton Laurie from Rakwane.

186. Polypodium (Drynaria) quercifolium, Linn.

Bed. 1. t. 187. This is one of the most abundant and most conspicuous ferns in Ceylon. It climbs up and often festoons the trunks of trees for a height of 20 to 30 feet and often grows in dense masses on the ground when the tree supporting it decays and falls down. The contrast between its small oak-leaf-like barren fronds, and its large pinnated fertile ones is very great.

It is often cultivated in Colombo, and grows very freely. The pinnæ generally separate from the rachis after they are dried just as if they were cut with a knife. (Polypodium (Drynaria) Linnæi, Bory. Bed. 11. t. 315. said in the Syn. Fil. to be a native of Ceylon; has not that I am aware of been found in the island.)

Tribe 12 Grammitideæ.

187. Monogramme Junghuhnii, Hk.

Bed. 1. t. 210. C. P. 1281. This is a very singular grass-like fern, with a creeping hairy rhizome, and linear filiform fronds, from 1 to 3 inches long, and about 2 lines broad. Found sparingly in the Central Province at elevations of 3,000 to 5000 feet. The Peacock mountain not far from the Trig. Station is one of its habitats. It is altogether so like a grass that the collector has to keep a sharp look out to find it. It is found in Java, Phillipine, and Polynesian Islands.

188. Gymnogramme (Leptogramme) Totta, Schlecht.

Bed. 1. t. 49. C. P. 1292. Mr. Thwaites states that this fern is common in the more elevated parts of the Central Province, but in all my wanderings I never found it. In p. 383 of En. Pl. Zeyl. under the section stenogramme, Sir Wm. Hooker states that he has the Gymnogramme (Stenogramme) aspidioides, Hk. Bed. 11. 149 from Ceylon on the authority of specimens from the late Dr. Gardner bearing the same No. (1292) as the C. P. one above, and that the two ferns are in Ceylon; the Syn. Fil. also gives Ceylon as a habitat for both, but no one as yet has found G. (S.) aspidioides in Ceylon.

189. Gymnogramme Javanica, Bl.

Bed. 1. t. 232 and 11. t. 57. This fern was found by Mr. Thwaites in the Horton Plains and Maturata District at an elevation of 5,000 to 4,000 feet. Major Hutchinson collected it below Hackgalla in company with some other rare ferns including the next species.

190. Gymnogramme leptophylla, Desv.

Bed. 1. t. 270. This remarkable little fern has been found in Ceylon since the publication of En. Pl. Zeyl. and is the C. P. 3934. Major Hutchinson gives the top of the Hackgalla rock as a habitat for it. Beddome says that it only appears during the rainy season. The Ceylon specimen is large, thin, and flaccid compared with a specimen lately received from Dr. Dickie of Aberdeen. This latter is a very tiny stiff plant, and very like dwarfed leaves of parsley; the specimen is from the Island of Jersey. Though a minute species, this fern is widely scattered over the globe; it is plentiful in many parts of the South of Europe, and is found in, "Jersey and shores of the Mediterranean, Barbary States, Azores, Maderia, Canaries, Abyssnia, Cape Colony, Persia, Neilgherries, New South Wales, Van Dieman's land, New Zealand, Andes of Mexico and Ecuador." Baker.

191 Gymnogramme (Selliguea) lanceolata, Hk.

Bed. 1. t. 51. This is evidently a rare fern compared with the next one. Thwaites gives Pedrotalagala at 7,000 feet as its habital. I got one or two specimens on the Wattakellie hill. In our Ceylon plants lines of sori run much closer to each other, and more in a line with the midrib than shown in Beddome's figure.

192. Gymnogramme (Selliguea) involuta, Don.

Bed. 1. t. 50. This is not an uncommon plant on the trunks of trees and on rocks in the Central Province. It is a very thick leathery fern and requires a good deal of care and pressure to dry it well. The sori on several of our Ceylon specimens are much further down on the frond than shown on Beddome's figure. It is not unlike 74, Asplenium ensiforme, in many respects, but its texture, is more leathery.

193. Meniscium triphyllum, Sw.

Bed. 1. t. 56. Said not to be uncommon in the Central and Southern Provinces. It is found in abundance a few miles from Agalawatte on the path from this place to Hewissa, and also near this latter place, but it seems to be rarely in fruit.

194. Meniscium Thwaitesii, Hk.

Bed. 1. t. 223 for C. P. 3145. This fern is peculiar to Ceylon, and was found in Uda-pussellawa, in the Central Province, at an elevation of 4,000 feet. Mr. Beckett; from whom I received specimens, found it at Lagalla.

195. Antrophyum plantagineum, Kaulf.

Bed. t. 52 good for the shape of the fronds, and 11. t. 267 ? for A. parvulum, Bl. as a small form of this fern. My specimens of this fern are from the higher parts of the Central Province such as Lindula, &c. and is not very common, whilst the next one is a very common fern, and I found it at the rock at Tallangama within 11 miles of Colombo. A. plantagineum has the fronds generally oblique, or somewhat falcate, and rhomboidal in shape, with an abruptly acuminated point, and a distinct stipes 1½ to 3 inches long, sometimes with a narrow wing, the lower part covered with long lanceolate dark brown hair-like scales, which cover about 1 inch of the lower part of the stipes ; the rootlets are rarely covered with ferrugineus hairs, and the sori are deeply immersed in the fronds. The hair-like scales are beautifully reticulated, and resemble some of the Ulvaceæ, and are ciliated along their margins. I was in hopes that these last were distinct and good characters by which to separate it from the next species, but the scales on both are reticulated and ciliated. See my notes on the next species.

196. Antrophyum reticulatum, Kaulf.

Bed. 1. t. 231 for C. P. 1305. This is also the A. semicostatum, Bl. described in Syn. Fil. as a separate Ceylon species. Bed. 1. t. 52 gave a wrong name ; in the letter-press for 1. t. 231 he makes the following remarks and corrections :—" The two species are nearly allied and perhaps not really distinct ; the following are the distinguishing characters :—

" 1. A. plantagineum, fronds broad falcato-lanceolate, receptacles deeply immersed, subglabrous. Nilgiris, Ceylon.

2. A. reticulatum, fronds narrow lanceolate, receptacles immersed, hairy, Ceylon."

Whilst after the description of 8 species, including our Ceylon ones, Baker in Syn. Fil. p. 393 remarks :—" Species 2 to 8 come very near to one another, and cannot be regarded as clearly distinct." Moore in his Ind. Fil. p. 82 quotes Gardner's 1307 for A. semicostatum Bl., but Thwaites, En. p. 456, shows that 1306, 1307, and 1308 are all=1305, but apart from this fact nearly all my specimens of 196 have the costa distinctly for 4 to 5 inches up in the frond, It differs from 195, in the following respects :—It is a common and abundant fern from near sea level to the Central Province, growing on rocks or stones, or on trunks of trees ; it is generally long lanceolate and tapering gradully to both ends with a comparatively blunt point ; it tapers gradually down to the caudex and is not hairy on the lower end of the stipes ; its rootlets are nearly always densely covered by ferruginous hairs, the fronds are generally straight, seldom falcate or bent, they are sometimes bifurcated, the sori are distinctly elevated, and mixed with ferruginous hairs. The hair-like scales on the caudex are narrower and in denser tufts than those on 195, but like them they are reticulated and ciliated. It is most likely that Baker is correct in the above remark. but in respect to the above notes, our two Ceylon ferns are pretty distinct, and easily separarated if completely mixed together. See notes on 195.

197. Vittaria elongata. Sw.

Bed. 1. t. 21 showing the fern to be erect instead of pendulous. This is truly a grass-like fern, hanging down from masses of decaying vegetable matter from the trunks of trees and not unfrequently from the mass below plants of the Asplenium nidus. The Syn. Fil. describes it as 6 to 18 inches long, and ⅛ to ¼ inch broad, and Beddome says it is 8 to 30 inches long I do not recollect seeing this fern less than 3 or 4 feet long, and my speci-

mens vary in length from 3 to 5 feet, and are from $\frac{1}{8}$ to $\frac{1}{4}$ inch broad. I have a specimen taken out by chance which measures 5 feet 3 inches. It grows on a hairy wide creeping rhizome, and is a very interesting fern. I've found it as near Colombo as the 6th M. Post on the Cotta road.

This seems to be the only Ceylon species of the true *Vittaria* which is characterised by having the sori sunk in a two lipped marginal groove, well shown in Beddome's figure. I notice that in En. Pl. *Zeyl. p. 438 under C. P. 3806, this fern is given as a native of the Central Province. It is not uncommon in the forest of the Western Province, but I never found it in the hills.

198. Vittaria (Tœniopsis) sulcata, Kuhn.

Bed. 11. t. 175, for C. P. 3807. In the letter-press Beddome says that this fern is found at 4,000 to 5,000 feet in the Central Province. I collected it in the forest between Ununagalla and Maussakellie in Kallibokka, in Oct. 1869. It grows on the bark of trees, and until carefully examined may be taken for small plants of the next species. V. minor, var minima, Bed. 11. t. 56 which Baker says is like this fern is a true Vittaria according to Beddome's figure.

198/1 Vittaria (Tæniopsis) lineata, Sw.

Bed. t. 54. C. P. 981. This is a common fern growing on the trunks of trees near Colombo, and in the Central Province. It is a more rigid fern than the V. elongata, but small plants of the two species are so like each other, that I find specimens of both in one ticket of C. P. 981 from the Peradeniya Herbarium. V. elongata has a long creeping rhizome covered with darker and finer hair-like scales, whilst V. (T.) lineata has a slightly creeping rhizome, but the fronds generally densely tufted, and they grow erect or partly pendulous. Small plants from the Cinnamon gardens in Colombo are not unlike V. (T.) falcata, and they agree well for the descriptions in Syn. Fil., and Beddome, and also with Bed. figure which shows it to be a true Tœniopsis. It is very generally found in dark vegetable mould amongst the singular aerial roots on the trunk of the Dawatagaha (Carallia integerrima) in the neighbourhood of Colombo.

199. Vittaria (Tœniopsis) Scolopendrina, Thw.

Bed. 1. t. 212. This is a well marked fern and is not uncommon in the forests of the Western and Southern Provinces, growing in dense masses in rich vegetable mould on rocks, or in the fork of trees. Mr. Thwaites gives the Central Province as its habitat.

200. Tænitis blechnoides, Sw.

Bed. 2. t. 54. This is a well marked and handsome fern. A single pinna of it not unlike a frond of the last one. It is found in the Kotawa forest about 10 miles to Eastward of Galle, and in great abundance along a swamp in a small piece of forest not far from Hewissa.

201. Drymoglossum piloselloides, Presl.

Bed. 1. t. 55. This fern and 173, Polypodium (N.) adnascens, are the two most common ones covering the trunks of coconut, mango, jack, and other trees in Colombo and elsewhere. The small nearly circular barren fronds, with the long tongue-like fertile ones, will at once distinguish this from any other of our Ceylon ferns. See notes on 173.

202. Hemionitus cordata, Rox.

Bed. 1. t. 53. This is a very common road-side fern near Colombo, and up to 4,000 to 5,000 feet elevation. Its cordate barren fronds, and its singularly triangular fertile ones, the under side of which is covered with sori, mark this fern at once as distinct from any other Ceylon fern. It is very liable to be eaten by insects unless poisoned.

203. Acrostchum (Elaphoglossum) conforme, Sw. Syn. Fil. t. 1. f. 1.

Bed. 1. t, 198 as Elaphaglossum conformé, and 1. t. 200 as E. lancifolium, and 1. t. 199 ? as E. stigmatolepis. In En. Pl. Zeyl., there is A. laurifolium for which C. P. 1310 is given, and A. marginatum C. P. 1311, after which it is said that it is "Distinguished from the preceeding by the much broader paleœ of the rhizome." I have no specimen of C. P. 1311, but some of my own specimens differ from 1310, in having a much longer and thinner creeping rhizome with the paleœ broader on them ; they are in this respect considerably different from 1310 which has a thick contracted rhizome with somewhat tufted fronds which seem shorter and broader, but as the Syn. Fil. quotes all these synonyms except E. stigmatolepis for A. conforme, I suppose there is no specific distinction between them. The part of the description in Syn. Fil. stating that the "barren frond is usually *narrower* than the fertile one," must surely be a mistake, as in all our Ceylon specimens the barren fronds are broader and longer in every respect than the fertile one. This fern is found generally growing in masses of vegetable matter encrusting rocks in the higher parts of the Central Province, not uncommon, but not often with fertile fronds. A. viscosum, Sw. said in Syn. Fil. to be a native of Ceylon has not been found in it.

204. Acrostichum (Elaphoglossum) spathulatum, Bory.

Bed. 1. t. 213. Found in Nuwara Eliya in a stream not far from the Church. This is one of our very rare ferns. It is a native also of that singular island Tristan d' Acunha. A dark brown hairy fern.

205. Acrostichum (Elaphoglossum) squamosum, Sw.

Bed. 1. t. 197. Central Province, not very common, Thwaites. Both sides of the fronds are "matted and the edges densely ciliated with bright reddish-brown ciliated linear or lanceolate scales." Baker.

206. Acrostichum (Stenochlœna) scandens, J. Sm.

Bed. 1. t. 201. Wœl-bendaru, Singhalese. This is one of the most common ferns in the warmer parts of the island. It is found creeping along fences or climbing up the stems of trees for heights of 20 to 50 feet, but is very seldom found in fruit. The natives use the rhizomes of this plant for tying their fences, and it is one of the plants most commonly used in this part of the island for this purpose. It vies with the Pothos scandens in festooning the trunks of trees, and when covering the trunk of the graceful Areca palm, it is a very beautiful sight. It was every where in full and beautiful fruit between Kaduwella and Hangwella in June and July 1873.

207. Acrostichum (Egenolfia) appendiculatum, Willd.

Bed. 1. tt. 194 and 195, and Bed. 11. tt. 110 and 111 for Indian forms of it. This is a common fern in the Central Province, growing in dense masses in rich vegetable mould, and so like some of the Aspleniums in general appearance, that Beddome has called 1. t. 195 Polybotria asplenifolia. This fern is remarkable "by the presence of a seta in the sinus of the lobes of the ultimate divisions." When the points of old fronds touch the ground they generally become viviparous like Adiantum caudatum, 210, and several other ferns.

208. Acrostichum (Gymnopteris) variabile, Hk.

Bed. 1. t. 48 as Gymnopteris Feei, Moore.
,, 1. t. 211 for C. P. 1318 var. pinnatifida,
,, 11. t. 271 G. axillaris, Cav. 11. t. 272. G. variabilis, Hk.
,, 11. t. 273 G. Feei. var. trilobata, 11. t. 274 abnormal forms of G. Feei., 11. t. 116 ? minus, Mett.

Besides this species, the Syn. Fil. gives Acrostichum (Chrysodium) lanceolatum, Hk., and A. (Crysodium) axillare, Cav. as distinct Ceylon species

The section *Gymnopteris*, Bernh. is thus defined in the Syn. Fil. "Fronds dimorphous. Main veins distinct nearly or quite to the edge," and the section *Chrysodium*, Fee. thus :—Fronds dimorphous or in A. aureum, upper pinnæ like the others and fertile ; main veins none or indistinct ;" but I fear that the several forms of this most variable fern will prove that the distinction is worthless, and that all the above are mere forms of one species. In a foot-note to the genus Hymenophyllum, Syn. Fil. p. 56. Baker states, that what are there described as about 150 species of Hymenophyllum and Trichomanes, Dr. Van den Bosch described as 450 species, and under no less than 24 genera. This note will throw some light upon the subject of our A. (G.) variabile. It is a very common fern growing in the ground close to stones or roots of trees, or on rocks and stones, from the higher parts of the Central Province down to the forests within 25 to 30 miles of Colombo.

Here again, the axiom proving that "things which are equal to the same things, are equal to each other," may prove useful. The following notes on the different figures published by Major Beddome in their order, may help to clear up some of the discrepancies in connection with our Ceylon fern :— Bed. 1. t. 48. In "*Notes on the Nomenclature*" of his two volumes of Indian and Ceylon ferns, he remarks,—"Gymnopteris Feei., comes under *G. lanceolata*, Hook. It is probable that *G. Feei, axillaris,* and *variabilis* are all forms of one species, and perhaps *G. minus.*" Bed. I. t. 211 is admitted to be for the C.P. 1318. This is a very common fern, with broad pinnatifid barren fronds in Kallibokka and elsewhere, but the fertile fronds not often found. "Segments of the fertile frond very narrow. A curious lyrate variety of the common G. Feei. I have not found it in India tho' the common form occasionally has the sterile fronds forked, variously lobed or even sub-pinnatifid, the fertile fronds seem always to remain simple. I may here also mention that I have occasionally found the broad sterile fronds of the common variety with a contracted fertile apex (as in Hymenolepis). It is, however, an abnormal state." After the description of Bed. 11. t. 271, G. axillaris, Beddome remarks,—"The specimen figured is from South Canara, it is common in most forests on the Western side of India, growing on trees. I have always looked upon it as a mere variety of G. Feei (1. t. 48,) but Sir Wm. Hooker thinks it a distinct species." And he adds Ceylon as one of its habitats. At 11. t. 272 for G. variabilis, he makes the following note—"The specimen figured is from the Courtallum forests, it differs from G. Feei in its very prominent costules. I have specimens from Burmah with the costules far more prominent and more regular than those in this figure, but I also have specimens nearly intermediate as to venation between true *Feei* and *variabilis*, and I have doubts about the two species being really distinct, the Courtallum plant is much more membranaceous in texture than Feei, and the venation is very prominent. Sir W. Hooker refers the Ceylon pinnatifid variety of Feei (1. t. 211) to this species, but it has quite the venation of Feei, each segment of the frond has a costa (as in my three-lobed variety figured in the next plate), but there are no prominent costules." This is the best figure in Beddome's ferns for what perhaps may be called the *normal form* of our Ceylon plant, and it is commonly grown in Colombo. On Bed. 11. t. 273 *G. Feei. var. trilobata,* he makes the following remarks :—"This is a curious variety of the common G. Feei. (1. t. 48). I have only found it in the forests of Coorg and South Canara, where it is abundant at an elevation of 2,000 to 3,000 feet, both sterile and fertile fronds are generally three lobed, though they are sometimes simply lanceolate." With reference to this form, I may remark that amongst a considerable set of specimens collected from the damp surface of rocks on the side of a stream near Hewissa, gradually diminishing from lanceolate to nearly linear, I happen to have some barren bifurcated fronds which agree exactly for one of those figured on this plate. That fronds can be found in the same place to agree with Beddome's entire figure is very probable. At 11. t. 274 figures are given of three singular forms with the following remarks : "G. Feei. Moore. The plate represents some curious abnormal fertile fronds of G. Feei. ; they are not uncommon in the large shola

at Kodinkarnel on the Pulney mountains and are found growing from the same caudex with the usual sterile fronds. I have never met with anything like them elsewhere, though I have searched very carefully in many localities. Mr. Fairbank, of the American Mission, first drew my attention to them, I have thought them well worth figuring in this work as they might be taken for some new species of Loxogramma if they got into herbaria apart from the normal form." The foregoing notes with a careful examination of a complete suit of specimens collected from all parts of Ceylon will, I believe, prove that all our Ceylon forms belong to one species. The difference between the large pinnatifid fern referred to above, and a beautiful grass-like fern discovered by G. Wall Esq. in Morawaka, with a single set of arched veinlets along the costule, is so great that if seen without the intermediate forms, it might be supposed that no two species of a genus could be more distinct, but I fear the connecting links are too evident to allow of their separation. I have never yet seen the fertile fronds of our Ceylon plants expanded, they look always like pieces of whip-cord or pack-thread. See 210/2.

208/1. Acrostichum (Gymnopteris) metallica, Bedd.

Bed. 11. (Supt.) t. 390. Fronds quite sessile 3-7 inches long up to nearly 1 inch broad of a deep shining metallic color, fertile fronds only soriferous towards the apex. Ceylon in dense moist forests on the Haycock mountain growing on rocks. This is intermediate between Wallii and true lanceolata and is, I believe, only a variety of the latter ; it is a very beautiful plant. Beddome.

I found this fern in abundance on the surface of rocks on the side of a stream at Hewissa. It is, I suppose, a form of lanceolata.

209. Acrostichum (Gymnopteris) quercifolium, Retz.

Bed. 1. t. 47. The oak-leaved fern. This is one of the most common ferns found on the sides of cabook cuttings or growing on cabook walls near Colombo and elsewhere in the Western Province. It is often intermixed with Hemionitis cordata, Adiantum caudatum, &c. It is a tiny fern with its barren oak-like leaves growing flat on the ground generally. It is often found lining the insides of wells near Colombo.

210. Acrostichum (Cyrtogonium) crispatulum, Wall.

Bed. 1. t. 202, as Pœcilopteris repanda, J. Sm., but said to be P. contaminans, Wall. Bed. 11. t. 115? as P. costata var. undulata, Hook, abnormal form. The fern I here refer to is C. P. 3075, and as I have no doubt this is the one described by Smith in Smith and Moore's Exotic cultivated ferns, at p. 48 under the genus Cyrtogonium, I shall quote the description entire :—

"Cyrtogonium crispatulum, J. Sm. (Acrostichum Wall.). A very handsome evergreen stove fern, from Ceylon. Fronds rather erect, somewhat lanceolate, broad at the base, acuminate, pinnate, one to two feet long, deep green ; pinnæ linear-acuminate, petiolate, glabrous, undulated, the margin crenate, with a row of spinulose teeth, one to each marginal sinus. Fertile fronds erect, pinnate one foot high; pinnæ narrow, and petiolate. Both forms are latteral, with a scaly stipes, adherent to a creeping, scaly rhizome."

The spinulose teeth in each marginal sinus are most apparent in C. P. 3075, from Peradeniya herbarium, and thus but for the difference in venation connecting it with Egenolfia, but on my own larger and more undulated specimens collected in Kallibokka, they are generally wanting.

This is doubtless "A (Gymnoptiris) virens Wall. var. b. *A crispatulum*, Wall. ; pinnæ narrow, coriaceous, crisped, the *veins* anastomosing principally in costal arches," Syn. Fil. p. 420.

It has been mixed up in A. virens with C. P. 1313, which is surely a distinct species. Beddome at 11. t. 270 remarks : Sir Wm. Hooker unites 1. t. 202, the *contaminaus* of Wall, with *terminans*, 1. t. 203, of the same botanist, under the name of *virens*, they are however, very distinct species."

I am of the same opinion, and therefore, keep them distinct. This fern so far as I know, is confined to the higher forests of the Central Province whilst the next one is found in abundance as low down as Sitawaka. They both vary in size and shape of the pinnæ, but the venation in each seems to be quite distinct. I have one abnormal sterile frond with fruit on the margins of the upper ends of the pinnæ, which in some respects resembles Bed. 11. t. 115 quoted above.

210/1. Acrostichum (Gymnopteris) Hookerianum, Moore.

Bed. 1. t. 203 good for the sterile frond, *bad* for the fertile frond of our Ceylon specimens. The specimen of C. P. 1313 from the Peradeniya herbarium, is small compared with all those collected by me, and the terminal pinna does not differ much in size or shape from the others, whilst generally it is much larger, very long, attenuated, and proliferous at the end. The following short description of this fern as the variety A. proliferum, Hk. of A. (G.) virens, Wall. from the Syn. Fil. p. 420, is excellent for this fern;—" *pinnae* broad, main *veins* close, distinct, the veinlets of contiguous groups joining at an angle, as in *Goniopteris,* from which proceed one or in the lower areolœ two free veinlets, terminal *pinna* usually elongated and rooting."

The figure of the fertile frond given in Bed. 1. t. 203, and Hook. Ic. tt. 681-2 is so very different from anything I have seen in our Ceylon plants, that it can scarcely be for the same plant. This fern is found in great abundance in the forest near 27th mile on the road from Colombo to Sitawaka. See note on the last one.

210/2. Acrostichum (Chrysodium) Wallii, Baker.

Bed. 11. (Supt.) t. 389. Sterile fronds lineare 8-9 inches long $\frac{1}{4}$-$\frac{3}{8}$ inch broad narrowed at both ends, fertile frond with the fructification often interrupted. Beddome. This is the fern referred to in my concluding remarks on 208, and is considered a good species.

211. Acrostichum (Chrysodium) aureum, Linn.

Bed. 1. t. 204. This is a most abundant fern all round the island in swampy places, and especially along the shores of rivers, canals, or swamps influenced by brackish water. It is sometimes found from 10 to 12 feet in height, and seems to be a common fern all round the world within the tropics and a few degrees beyond them. This fern must be carefully dried under lots of pressure, and then poisoned afterwards, otherwise the fertile parts are very liable to the attacks of insects. This is the *A. esculentum,* of Moon, the *kœra-kokka* of the Sinhalese. The young fronds of it are eaten in curry like those of *Asplenium esculentum.*

212. Acrostichum (Hymenolepis) spicatum, Linn.

Bed. 1. t. 46. This fern is found growing sparingly on the trunks of trees in the forests of the interior, and so like 177. *Polypodium* (*P.*), *lineare* when not in fruit that they are liable to be confounded. The contracted fertile apex of its fronds will at once distinguish this from any other fern.

SUB-ORDER, III. OSMUNDACEŒ.

213. Osmunda Javanica, Bl.

Bed. t. 77. This is a remarkable fern and can at once be known from having its lower and central *pinnae* fertile. Seen growing in small islets in the river near Logie, Dimbula, in a stream between Nuwara Eliya and Hackgalla in abundance, and evidently not uncommon in the higher part of the Central Province. This is our Ceylon representative of the Royal fern *Osmunda regalis* which seems a native throughout the world, though not found in Ceylon.

SUB-ORDER IV. SCHIZEACEŒ.

214. Schizea (Actinostachys) digitata, Sw.

Bed. 1. t. 268. This is a very curious grass-like fern, growing in erect tufts under the shade of dense jungle or forest in the low country, and found

within a few miles of Colombo. But for the digitate fertile ends of its fronds, it might be easily mistaken for one of the grasses. It is one of those collected in Ceylon in 1660 by Paul Hermann, and described in the Flora zeylanica of Linnæus.

215. Lygodium dichotomum, Sw.

Aet-Pamba. Sinhalese. Bed. 1. t. 62. When in full fruit, and hanging down in festoons from a height of 25 to 30 feet, this is one of the most beautiful ferns known. It is found in rich clayey soil on the edges of forests, about 20 miles from Colombo. and from the fact that it generally climbs up on some tree, and has its fertile fronds at the tops of the stems, it is often not detected, whilst the next two species are the most common climbers in swampy places, and in fences within a few miles of Colombo, and no traveller can visit the places where they grow without being struck by their beautiful fringed-like fronds. This fern can easily be distinguished from either of the next two by its larger and stouter stems, and the long somewhat palmate divisions of its fronds.

216. **Lygodium scandens, Linn.**

Maha-Pamba, Sinhalese. Bed. 1. t. 61. This and the next one were collected in Ceylon by Paul Herman in 1660, and described in the Flora Zeylanica by Linneus. They are the most common climbing plants in swamps in the Cinnamon Gardens, on the roads to Kotte, Kelaniya Temple, and all about Colombo. The specific name "*Scandens*" is a most unfortunate one for a genus where all the species are scandent, but the rule is to stick to the first specific name under which a plant has been properly described, so that the utterly scentless white flowered *Thunbergia fragrance*, Rox, so common in Ceylon must retain its name. This fern can easily be distinguished from the next one by its generally cordate small divisions of the fronds, the fertile ones of which are beautifully fringed with the peculiar fruit. Æt Pamba, meaning Elephantine, and agreeing for our gigantic, may be a good name for 215, but why this one should be called *Maha*, great, I do not know, as it is the smallest of the three species. See notes on the next one.

217. Lygodium pinnatifidum, Sw.

Heen-Pamba, Sinhalese. Bed. 1. t. 63. This fern grows generally in the same places as the last one, and is easily distinguished from it by its larger fronds, especially the barren one. It vies with it in beauty when in full fruit.

It is a singular fact that these two plants should be almost invariably used by the Sinhalese to make their scare-crows, which are called *Pambêya,* but whether they are so called because made of the Pamba-plants, or whether the latter are so called from the fact that they are made into scare-crows, I do not know. The stems of both are used in the interior to lay under a coating of the leaves of the small bamboo-plant, the *batalee, Bheesa stridula,* for thatching houses. During upwards of thirty years I have noticed that the natives who carry charcoal in Pingos from the interior to be sold in Colombo, invariably have a heap *above* the baskets, but surrounded by the stems of these two *Pambas.* I have often asked the question why they could not use baskets large enough to carry the proper quantity without the use of the stems of the Pambas, but never got a satisfactory answer, although I have no doubt there is some good reason for this practice.

SUB-ORDER V. MARATTIACEŒ.

218. Angiopteris evecta, Hoffm.

Bed. 1. t. 78. This is a common fern from near the coast to an elevation of 5,000 feet. It has a very thick caudex, and when growing in rich masses of vegetable soil on the banks of streams in the interior, its large ample fronds vie with those of the tree ferns.

It is a fine fern and grows easily in Colombo in a large mass of good soil when well looked after.

219. Marattia fraxinea, Smith.

Bed. l. t. 79. This is a much more rare fern than the last one. It evidently vies with it in stature, as the fronds of both are described to be from 6 to 15 feet long. It is very like the last one, but the fruit is different and this one has the pinnules generally more deeply serrated than the last one. This fern is confined to the more elevated parts of the Central Province.

Sub-Order, VI. Ophioglossaceœ.

220. Ophioglossum nudicaule, Lin. Fil.

Bed. l. t. 71, as O. parvifolium, Linn. I found what I believe to be this species in an open space in front of what was Mr. Duff's house in Nuwara Eliya in 1859, just where the road divided in front of the house, and I have no doubt but it will be still found there if any of the ground has been left in an unbroken state.

221. Ophioglossum vulgatum, Linn. var. O. reticulatum, Linn.

Bed. l. t. 70 and l. t. 72? On the C. P. 1408 specimens from the Peradeniya herbarium Thwaites has written Ophioglossum vulgatum, Linn. The barren fronds on these are broad ovate, obtuse, and slightly cordate at the base, sessile on the stalk, and placed about an inch from the lower end. The fertile spike is from 1 to 1¼ inch long, and the peduncle 5 to 6 inches long. Most of my specimens, collected in a compound in Colpetty, Colombo, or grown by myself, have the sterile frond 2 to 5 inches from the rootstock, several of them being deeply cordate, but otherwise agreeing well for Bed. l. t. 70. I have one specimen agreeing with l. t. 72 O. brevipes, in respect to numerous fronds from the same rootstock, but the sterile fronds are deeply cordate, and are placed from 1½ to 2 inches from the bottom of the stalk. The Syn. Fil. gives O. vulgatum and O. reticulatum as distinct species, but I am guided in giving our Ceylon one as a variety of the former in consequence of the following note by Dr. Hooker in his article on the plants of the Camaroons Mountains, &c. Linnean Jl., Botany, vol. VII. for 1864, p. 237. "Ophiglossum reticulatum, Linn. *Hab.* Fernando Po, from the sea to 5,000 feet. A form of *O. vulgatum*, found in many warm countries." If they are really distinct species then our Ceylon one must be referred to O. reticulatum I have not heard of O. vulgatum as a distinct plant found in Ceylon. Our Ceylon fern varies exceeding in size, shape of frond, length of peduncle, &c

222. Ophioglossum (Ophioderma) pendulum, Hk.

Bed. l. t. 88. This is also called the "*Ribbon-fern*" in Ceylon. It grows in masses of vegetable mould in the forks of trees and very often under the great mass of turfy-like stuff in which Asplenium Nidus grows, and is not uncommon from near the coast to considerable elevations. This is a very fine fern, and I have seen specimens of it with fronds upwards of 12 feet long, and only about 1¼ inch broad. I have seen specimens of it with nearly every frond once or twice divided. Mr. Cameron, who made the Peradeniya fernery shortly after his arrival from Kew, was greatly delighted with the sight of this magnificent fern in its native luxuriance. *Vittaria elongata* sometimes grows intermixed with it.

223. Helminthostachys zeylanica, Hk.

Bed. l. t. 69. The aspect of this fern is so like young plants of Amorphophalus campanulatus, Bl. that they are very liable to be mistaken for each other. The curious spiked fertile part of the frond will at once distinguish the fern.

This is a common fern in rich clayey soil under the shade of coconut trees along the Negombo and Hangwella roads not far from the Bridge of Boats, and is easily cultivated.

224. Botrychium daucifolium, Wall.

Bed. 1. t. 68. This is not an uncommon fern growing under the shade of dense forests in the more elevated parts of the Central Province. The fertile branch of the rachis rises considerably below the leafy portion of the frond. It is a larger and more flaccid plant than the next one, which has not hitherto been found out of the Nuwara Eliya Plains.

225. Botrychium virginianum, Sw.

Bed. 1. t. 67. This is a small dwarf-looking fern compared with the last one, and is found in Ceylon only in the grassy plains of Nuwara Eliya. The following note by Mr. Thwaites in En. Pl. Zeyl. p. 378 will enable any one to distinguish this fern from the last one. "In general appearance very like the preceding species, but at once distinguished from it by the fertile branch of the rachis arising from the middle of the leafy portion of the frond, whilst in the preceding it originates below it.

Lycopodiaceœ.

226. Lycopodium phlegmaria, Linn.

Fl. Zeyl. No. 386 and Herb. Herm. Willd. sp. pl V. 10. Maha-hœdaya, Sinhalese. Pendulous. L. mirabile, Willd. l. c. 11, Kuda-hœdaya, Sin erect form. The pendulous form of this splendid Club-moss is found growing in masses of decayed leaves, &c. in the forks of trees sometimes at a great height, and hangs down in very graceful tassels, the lower and fruit bearing ends several times divided. It is a very beautiful and most variable plant, and forms of it and of the next one, L. Hookeri, so run into each other, that it is most difficult to separate them.

It is not uncommon in damp forests from near the coast up to several 1000 feet elevation. It occasionally is several feet in length. The erect form is a stiff, rigid, and coarse plant and is found growing on rocks on the ridge separating Nilambe from the district of Hewahette.

The following remarks by Sir J. D. Hooker, in Fl. Ant. 1. 116. are so entirely applicable to the erect plants I here refer to that they seem to be for the same plant.

"L. varium. L. in Lord Auckland's group and Campbell's Island, is one of the finest of the genus; it grows nearly erect on the bare ground, to a height of 1-2 feet, branching upwards, copiously leafy, with large spreading leaves, bearing at the apices of the branches numerous pendulous or drooping tetragonous spikes 2-4 inches long. The stems of this species are often nearly the thickness of a swan's quill, with spreading leaves as broad as the middle finger; I have nowhere seen handsomer specimens of it than this Island presents, and more constant ones, for it is confined to the woods, and does not ascend the hills, neither varying in the narrow belt it inhabits nor seeking other localities where it would be exposed to the influence of existing causes."

If the following remarks indicate that L. varium and L. selago run into each other, and that there is no mistake in Carmichael's specimens of L. insulare, coming from Ceylon, then we have a form connecting L. phlegmaria, with L. Selago which is said by Hooker "to be perhaps the most variable plant in the world." "This state is nearly allied to some Indian forms of the genus, as also to L. lucidulum, Mich. which varies in the serratures of its leaves and in other particulars approaches very near, if it does not absolutely merge into, American forms of L. selago. Nor is it to be distinguished from Ceylon and Tristan d' Acunha specimens of L. insulare, Carm. which further passes into L. crassum, Hook and Grev., and through it into some other South American species."

227. Lycopodium Hookeri, Wall.

Hooker and Greville, Ic. Fil. t. 185. Found in great abundance on the face of rocks and on trees on the tops of the higher ridges in the Kandyan country. C. P. 986. for the narrow leaved forms, and C. P. 3281 for broad

leaved forms. This is perhaps one of the most variable plants in Ceylon, and my specimens of this one and of L. Phlegmaria so run into each other that I have great trouble in separating them. "Very variable in the form of its leaves, but the size and shape of the sporangia very constant. Spring refers this to L. ulicifolium, Vent." Thw. En. 377.

228. Lycopodium S rratum, Thunb.

Fl. Jap. 341. t. 38. Willd. l. c. 51. Hook. et. Grev. Ic. Fil. t. 37. Gas-hœdaya, Sin. C. P. 1419. "Forma foliis minoribus, magis confertis, firmioribus. in conspicue serratis, C. P. 1415." Thw. Entirely terrestrial, and found by me in great abundance some years ago in gullies and generally in rich soil on the banks of streams, in the forest near Mattakella, Dimbula, near Le Vallon-in Nilambe, and in the belt separating Dikoya from Maskeliya. Although Dr. Thwaites has given two C. P. Nos. for this plant and says that it is equally variable with the preceding, I believe that the different forms of C. P. 1419 are the result of age and climate, but the form C.P. 1415, looks very different and is not unlike L. selago in many respects.*

229. Lycopodium clavatum, Linn.

Willd. l. c. 16. var. L. Magellanicum, Sw. and L. confertum, Willd. l. c. 15. and 27. Hooker Flora Antartica. i. 113, ii. 394, 550. Bentham, Illustrated Handbook of the British Flora, ii. p. 1021. Fig. 1243. C. P. 3283. The Common Club Moss, Badge of the Sinclairs. This is the first and best known of the family by me, and is found in great abundance growing amongst the heather on the Mulbuoy between Conan and Inverness, where I first found it in my boyhood. Dr. Thwaites gives the Horton Plains at an elevation of 7000 feet for the Ceylon plant. My specimens were sent to me from Nuwara Eliya and Pedurutalagalla at 6,600 to 8000 feet. It has creeping hard stems 1 to 2 feet long, with ascending forked branches, 1 to 3 inches long. It is used in Scotland for decorations in the same way as the Badal-wanassa L. cernuum, is in Ceylon. "Its spores are used on the stage to produce artificial lightning, from their highly inflammable nature. They are also employed

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*The following remarks on Lycopodiun Selago, from Moore's British Ferns and their allies p. p. 141-2, are so applicable to my specimens of C. P. 1415, that I quote them entire, and beg to suggest that L. serrata and L. selago run into each other :—

"The fructification is in this species not borne in terminal spikes as in the other kinds, but is produced in the axils of the leaves at the upper part of the stems. The spore cases are rather large, sessile, kidney-shaped, two valved, and filled with minute pale yellow spores.

Besides the ordinary spores, the plant is furnished with other means of propagation in the shape of deciduous buds, produced for the most part in the axils of the leaves, about the apices of the branches. These buds separate spontaneously, fall to the ground, and there vegetate, first producing roots, and then elongating into a leafy stem. They are formed by an altered leaf, which, becoming somewhat swollen on the outside, protrudes from its inner margin five smaller lanceolate leaves or teeth, the whole being elevated on a short hardened footstalk. Within this is a whorl of five parts representing a gemma or bud ; the three inner lobes of this series are large and prominent, and of an ovate oblong acute form ; the two outer lobes are very small, scale like, one closely appressed to the anterior, the other to the posterior surface of the bud. In the centre of the three inner lobes, in due time, appears a thickish oblong body, which is in reality the undeveloped stem, and eventually elongates, puts out small leaflets, and becomes a plant.

These buds are capable of growth either while attached to their parent stem or when detached and in contact with the soil ; and they appear to be the chief means of propagation possessed by this species, for the statements which have been made respecting the germination of the spores of the Fir Club-moss are open to much doubt. Probably it was these buds which were caused to germinate.

by Apothecaries to keep pills from sticking together. They have such a strong repulsive power, that if the hand is powdered with them, it can be dipped in water without becoming wet." M. J. Berkly. Maun. Trea. Bot. 2. 703.

Found in Lord Auckland's group and Campbell's Island in 52° South, by Sir Joseph Hooker, at a considerable elevation on the hills.

"In hilly pastures and heaths, in Central and Northern Europe, Russian Asia, and North America, extending from the Pyrenees and the Alps to the Arctic regions, and in the Southern hemisphere, generally distributed over Britain, but more common in the North." Bentham l. c.

230 Lycopodium complanatum, Linn.

Willd. l. c. 19. Hooker. Fl. Ant. 1. 112, 113 and 114. Hook. and Bauer. t. 117. A. C. P. 3489. Horton Plains with the preceding. Thw. En. 377.

"This is a very widely diffused plant throughout the temperate and Arctic regions of Europe, Asia, and America; we possess specimens of a very similar, if not the same species, from upper India and the Peninsula of Hindostan, as also from Jamaica, from Mexico, Colombia, Peru, Caracas and Brazil, it is the L. thuyoides. H. B. K." Hooker Fl. Ant. 1. 112. This is not a British plant. It is evidently a very rare plant in Ceylon.

231. Lycopodium cernuum, Linn.

Fl. Zeyl. No. 387. and Herb. Herm. Willd. l. c. 30. Burm. Thea. 144. t. 66. Hooker l. c. 114-5.

Badal-wanassa, Wil-wanassa, Sinhalese. The "Goldsmith's Destroyer" in Ceylon.

This species "may be considered the type of another natural section; it is perhaps the most abundant species of the genus, throughout the tropics especially, probably covering more space than any two others. There are specimens from "no less than fifty different stations, and seventy collectors, preserved in the Hookerian Herbarium; its Northern limit seems to be lat 39°, where it is found in the Azores Islands (in the neighbourhood of warm springs, M. J. B.) and its Southern the Cape Colony and St. Paul's; this, like several other very widely diffused species, does not inhabit the Australian continent, as far as I am aware," Hooker. l. c. It has been sent to me from Queensland, land called L. uliginosum.

"All the species of the *Cernuum* group are robust in habit, erect, generally tall, copiously branched with their branches spreading on all sides; the spikes are sessile and very numerous, their mode of growth suffisces to distinguish them from the *Annotinum* section." Hooker l. c. This is a very abundant plant in marshy and low grounds in various portions of the Western and Central Provinces, and some years ago large fields of it grew in the Cinnamon Gardens, Colombo. It is found also on the faces of cabook and other cuttings in the same places, and in this case is a spreading procumbent plant. It is the best known and most abundant plant used for the decoration of ball rooms and other festive occasions in Ceylon, and is generally mixed with 216 and 217, Lygodium scandeus, and L. pinnatifidum, and Gleichenia dichotoma for these purposes; but it is regretted that it has been so perseveringly rooted out for this purpose without a thought of leaving some plants to enable it to grow and spread, that it is now becoming a scarce plant near Colombo. It is a current belief amongst the Sinhalese that one of the Kings of Kandy employed an eminent goldsmith to imitate this plant in gold or silver, and that after he had done so the King killed him, to prevent his making imitations for any other person, hence the plant is called the "*Goldsmith's Destroyer.*" (See Lyel's Principles of Geology, p. 594 for geological facts connected with this species.)

23?. Lycopodium Carolinianum, Linn.

Willd. l. c. 14. Flora of Mauritius and the Seychelles, Baker, p. 520. C. P. 1416. Dr. Thwaites gives Pedurutalagala, at an elevation of 7,000 feet, as the habitat of this plant. I found it not uncommon on moist grassy places in different parts of the plain in Nuwara Eliya. The main stems spread flat

on the ground and cover patches of several feet in extent, solitary spikes about one inch long on one to two inch long peduncles.

"The *L. carolinianum*, L. accompanies the last mentioned species, (L. inundatum,) throughout the temperate and warm parts of the American continent, and has also a very wide range through other countries, having been found in tropical and South Africa, the East Indies, Madagascar, Tasmania, and New Zealand ; these two constitute part of a natural section allied to the *Clavatum* group in the spiked, more or less pedunculate fructifications, and ascending direction of the leaves on the prostrate stems, and to the *Complanatum* division in the tendency of the leaves of *L.carolinianum* to become distichous and decurrent, the other species of it are *L. selaginoides*, L. and *L. pygmoeum*, Kaulf." Hooker l. c. 114.

When spending some days with Professor Dickie of Aberdeen in 1875, and making notes on the best kinds of coal for producing gas, specimens were exhibited, and mounted sections of them examined under the microscope ; proving according to Dr. Dickie that nearly all the good coals on which a scratch of a knife, &c. made a *yellow mark* were nearly entirely composed of the *capsules* of species of Lycopodium.

SELAGINELLACEÆ.

SELAGINELLA, *Beauvias*.

Jungermannia-like or fern-like plants, frequently creeping; the stems usually much dichotomously branched, clothed with leaves of two forms, disposed in four rows. The fructifications form angulate spikes. This genus is separated from Lycopodium on account of its producing two kinds of spore-cases. The stems usually bear two kinds of leaves, the larger disposed in a distichous manner, stipuliform ones being placed between them. Moore, Index Filicum. p. cxxviii.

Spring's Monograph of the Lycopodiaceæ, referred to by authors and quoted by Dr. Thwaites for the species of Selaginella, I have not seen and therefore I take the references to this author from Dr. T. All our Ceylon Selaginellas are so different in appearance and in the size of their parts, compared with the Lycopodiums enumerated above, that they are easily distinguished from them. The two genera were formerly included as Lycopodiums.

233. Selaginella rupestris Spring.

Mon. Lycop. pt. 2, p. 55. Lycopodium rupestris, Linn. Willd. Sp. pl. v. p. 30, C. P. 1412. Len-pahuru, Sin. Found at Dambul by the late Dr. Gardner. I have not collected this plant ; my only specimen was received from Mr. Beckett, found on the rock near the Dambul Rest-house. The specimen indicates that it is allied to the singular South American *S. convoluta* which has the fronds curiously curled in and contracted when dry, so as to form a ball like the rose of Jericho, which expands when moistened.

The late Major Skinner used to exhibit a specimen of *S. involuta* which he had in a dried state for years, but which on being placed in water would expand and look quite like a growing plant. The *S. rupestris* is a small apparently erect plant, difficult to cultivate. It was found by Moon on rocks in Lower Uva.

234 Selaginella stolonifera, Spring.

Mon. 209. Lycopodium stoloniferum, Sw. Willd. l. c. 40. C. P. 1412. This is a very abundant plant in the damp forests of the Kandyan country, where it often spreads to a considerable extent, sending down wiry roots from its several divisions for its support. It is a handsome plant with large metallic looking leaves when growing in rich soil in the dense shade of the forest. It has been occasionally grown in Colombo, but is impatient of exposure and dryness of weather. Stolonifera seems an unfortunate name for this one in a genus with so many stoloniferous species.

235. Selaginella candatum, Spring.

Mon. 139. Lycopodium candatum, Desv. Benth. Fl. Hoagk. p. 437, C. P. 3284. This is a fine tall erect fan-like plant, and the most robust of our Selaginellas. It is evidently a rare plant confined to the forests of the higher mountains. I have not collected the plant representing the C. P. 3284, but the specimens I have seen indicate that it sends down long roots from the lower parts, the upper erect and growing without support. When Dr. Thwaites was looking over my packets of Selaginellas several years ago, I attracted his attention to a small plant which I found first spreading close to the ground and rooting at every joint, near the Hangwelle Rest-house and afterwards not far from Kelaniya about seven miles from Colombo. I could not fit this one into any of the plants given in the En., but the Dr. ultimately said it was *S caudata*, but its habit and place of growth are so different from the large erect Kandyan plant that I doubt their identity. The small one grows readily on the surface of shaded flower pots in Colombo.

236. Selaginella caulescens, Spring.

Mon. 158, C. P. 985. A very abundant plant growing on rocks on the summits of the higher ranges of the Kandyan country, where it grows in dense upright tufts, with rigid wiry stems, and of a light green color, but not often in fruit. This plant grows generallg in the full blaze of the sun, and very little soil, so that it does not seem to possess any moisture and no amount of pressure in drying it seems to prevent it from curling up when the pressure is removed. It is easily distinguished from all our other Ceylon species by its habit and the scattered sessile arrow-shaped leaves round its stems.

I had some trouble in fitting into this species a few almost stemles plants collected by me in some parts of the Western Province ; several trials to grow it in Colombo resulted in failure.

237. Selaginella atroviridis, Spring.

Mon. 124. S. monospora, Spr. l.c. 135. Lycopodium atroviridis, Wall., Hook. Gen. Fil. t. 117. B. Benth. l. c. C. P. 1417 1418.

A very abundant and variable plant, some forms of it a good deal like 234, S. stolonifera, but it is generally an erect plant growing in beautiful erect tufts. Found in the forests of the higher ranges of the Kandyan country and most abundantly as a weed in coffee estates in several districts, and now, if I am correct in my belief, equally common in the cleared group of Liberian coffee estates a few miles inland from Kalutara. Here and in some coffee estates in Dimbula it spreads along the ground to a considerable extent, forming a dense cushion in which no other small plant can well grow, and often in separate erect tufts in abundance of fruit. I notice that the planters religiously scrape this plant and Oxalis corniculata from the surface of the ground as weeds, but I question if these two pl nts are not more beneficial than otherwise by preventing the soil from wash during heavy rains. The Selaginella at least does not rob the soil of much as its roots do not penetrate to any depth. Several attempts to grow this beautiful and delicate plant in Colombo failed.

238. Selaginella concinna, Spring.

Mon. 199. Lycopodium concinnum, Sw. Willd. l. c. 40. L. ornithopodioides, Lin. Fl. Zeyl. No. 388. p. 184 Hern. Herb. 3. fol. 1. Willd. l. c. 36. Bird's-foot Salaginella. Balal-pahuru, Sinhalese, which means Cat's-claw. Moon, Cat. 75. A very abundant, and very variable plant as to size, collected by Paul Herman in Ceylon in 1676-67 and given by Linnæus in his Flora Zeylanica as above. In quoting the Synonyyms for this plant I depend on my "*inward consciousness.*," to some extent, as I have no modern work on this family where the synonyms are given. Moon gives Colombo as its habitat, where it is found in great abundance, and no other species wild that I am

aware of. If generally affects wet banks or swards where it creeps to a great extent, and sends up fruit spikes about an inch in height when exposed to the full blaze of the sun, and in such places it is most common from the sea coast up to 2,000-3,000 feet elevation, forming beautiful moss-like patches. Under the shade and in moist rich soil single plants of it become stoloniferous from the several branches and spreads over the surface of the ground to the extent of 1 to 2 feet, and here it assumes a beautiful metallic color, like a species lately introduced to Ceylon. As far as I can see it is easily identified in all its various forms. I have grown it in pots in Colombo and when it covers the whole surface and then hangs over the edges and is in full fruit it will vie in elegance and beauty with any of the other species, two foreign ones of which are extensively grown in Colombo, and are excellent plants for covering rock work and for mixing with bouquets of flowers or for edgings to fruit dishes.

This and the other species of Selaginellas, are invariably called "*Mosses*" by people who do not care for the distinctions recognised by Botanists, and it would be as futile to attempt to alter this idea, as it would be to try and convince most non-Botanical persons of the vast difference between "*Cassia,*" and "*Acacia!*"

I have in my collection several forms of this genus which I am uncertain about, and I received from Dr. Thwaites two forms added to his collection since the publication of his En. Pl. Zeyl. C.P. 3975, is a flaccid plant with a creeping habit, found by Dr. Thwaites at Kurnagala and Peradeniya in August 1868. It is like some forms of 238. S. concinna, but seems distinct.

C.P. 3979. Collected by Dr. Thwaites in Kallibokka in Sept. 1868, is a small erect plant from 1 to 1½ inch in height and is in full fruit. When I received these two Nos. I looked upon them as forms of 237. S. monasphora, and it is likely they are so.

Moon in his Catalogue, p. 75, gives Lycopodium repens, Sw. Fil. 180 Willd. l.c. 15. with Bin-hædaya as the Sinhalese name, and the Raygam Korale as its habitat, but this is likely a synonsym of L. Carolinianum. Whether Moon's plant is this one or one not included in this list I cannot say. Moon also gives an erect annual one, for which he quotes:

Lycopodium canaliculatum, Lin. Willd, l.c. 43. Sw, l.c. 184, and gives Mahapana dætta as its Sinhalese name, and Saffragam as its habitat. It may be Selaginella caudata.

Lycopodium ciliare, Retz. Obs. 5.32. Willd. l.c. 46. given by Moon as Heenpana dætta, Sin. and habitat, Saffragam, is given as a Ceylon plant by Retzius, but as more than one of our Ceylon Selaginellas have ciliated leaves it is likely a syn. of one already given above.

Selaginella brachystachya, Spring Monog. Lycop ii. 256 given by Baker in his Flora of Mauritius, 524, as a native of Mauritius in shady places, and also Ceylon and East Himalayas, I cannot make out. It is perhaps S. caudata given above.

239. Psilotum nudum, Griesbach.

Flora British West Indies, 130. stem 1-2 feet long, erect, the ultimate branches triquetrous, not more than $\frac{1}{24}$ inch thick. Leaves at most as long as the thickness of the branches, shorter than the capsules. P. triquetrum, Sw. Baker in Flora of Mauritius, 521. Thw. En. 378. C. P. 1420. Æt. hawari, Sin. Bernhardia dichotoma, Willd.; Hoffmania aphylla, Willd.; Lycopodium nudum Linn.; Willd. l.c. 56-7. My specimens of this plant are from coconut trees near Jayella, about 13 miles from Colombo, and from the large Kumbuk tree at Mutwal, but I have received specimens of it from other parts of the island. It is so liable to be eaten by a species of small brown beetle (Anobium) that my specimens not having been poisoned are almost entirely destroyed. It seems to be a native everywhere within the tropics and a considerable distance beyond them.

It bears cultivation well, and is not uncommon in hothouses. The spores burst when placed in water, and emit a cloud of microscopic particles.

This plant should properly have come in after the Lycopodiums, but to put it there would break up the numbers which I refer to in the introduction and elsewhere.

MARSILACEÆ.

A family of pseudoferns possessing a distinct leafy stem; composed of a small number of plants of minute dimensions, but of great interest in a physiological point of view. They are all aquatics, some growing in the mud in and around sheets of water, others floating on the surface of the stagnant waters. The genera composing this family are Pilularia, Marsilea, Salvinia and Azolla, the second and last of which only are natives of Ceylon.

Marsilea, dwarf herbs, having a creeping rhizome and long-stalked leaves, growing at intervals, either singly or in small tufts, and consisting of about four cuneate-obovote leaflets placed crosswise at the end of the petiole, nerved somewhat after the fashion of those of *Addiantum*, and which at night fold up like the leaflets of many Leguminosæ, the fructifications growing either from the rhizome at the axils of the leaves, or from the petiole of the leaf Moore, Berkeley, and others.

240. Marsilea quadrifolia, Linn.

Sp. Plant. 1563. Will. l.c. 538. Diya-ambulœbilya, Sin. Ari-Keeri, Neeroolarey; and Ari-ileykkany, Tamil. A very common plant in the edges of water, and covering low muddy places in Colombo and other parts of the island. It is so like in general appearance to the very common creeping sorrel, oxalis corniculata, that the Sinhalese name indicates water-sorrel. It is also very like a creeping clover. It is an esculent plant amongst the Tamils, who collect it as a *keeri*, or greens. Dr. Müller of Melbourne believes that is this the famous "*Nardoo*" figured and described in the *Melbourne Weekly Herald* of Aug. 7, 1863, whilst Moore states that the Nardoo is M. macropus, sometimes called M. *hirsuta*, and M. salvatrix. the spores and spore cases of which are used by the aborigines for food. Some of the survivors of the Australian exploring expedition under Mr. Burke in 1861. prolonged their lives by the sole use of this food. The last words of Wills in his diary were:—Starvation on Nardoo is by no means very unpleasant, but for the weakness one feels, and the utter inability to move oneself; for as far as appetite is concerned, it gives me the greatest satisfaction"

241. Marsilea erosa, Willd.

Sp. Plant. l. c. 540. C. P. 1422. My specimens are from Mr. Beckett from Malate, and from Dr. Thwaites. It is evidently rare compared with other species as I have not noted it in my travels. It is the Vara-Ari of the Tamils. It is at once distinguishable from M. quadrifolia by its leaves, which are toothed in a very irregular manner as if bitten.

242. Azolla pinnata, R. Br.

Prod. Nov. Hol. p. 167, Salvinia imbricata, Rox. Calc. Journ. Nat. Hist. 470. C. P. 1421 Common floating on the surface of water in some of the warmer parts of the island, and often grown on the surface of flower pots filled with water.

"A very curious genus belonging to the Marsileaceous division of the pseudoferns. Its habit is that of a floating pinnately-branched *Jungermannia*, with two or four-ranked imbricating leaves; but its fructification is totally different, and is nearer to *Salvinia* than to any other genus, and with which it forms a distinct section or order, according to the views of authors. Indeed, its peculiarities are such that it has sometimes to constitute a distinct order] by itself. The species float upon the water, forming green or reddish patches, which are frequently several yards across, throwing down rootlets on the under side, amongst which are situated, principally in the axils of the leaves, the organs of fructification. The species occur from Australia and New Zealand as far as New York; one has been found in Western Africa by Vogal. It has been supposed that the differences

in the antheridia and the number of spores, accord with the geographical distribution of the species, which may accordingly be separated into two genera: but this is at present more than doubtful." Berkeley. The late Dr. Buchanan Hamilton found this plant to the Eastward of Bengal, and Dr. Royle in Behar. When grown in Colombo it spreads so rapidly that a marked difference can be observed in the surface it covers in the course of one day.

EQUISETACEÆ.

By a singular omission the following species of this remarkable family of plants tho' found in Ceylon by Moon, between 1817 and 1824, in Uva, and given in his Catalogue, with its native name, was omitted in the enumeration of Ceylon plants by Dr. Thwaites. The following notes on the family and genus are taken from the Rev. M. J. Berkeley, and Moore's British Ferns, and their allies:—The family consists of only one genus Equisetum, compounded from *equus*, a horse and *seta*, a hair or bristle; whence comes the English name of Horstail,—a not inapt comparison with the barren stems of the species The Equisetaceæ of former ages were far more important as regards size.

This race of plants have an aspect altogether different from that of the foregoing groups; and indeed they have no very obvious connection with any existing order of plants. In their mode of growth they have a certain resemblance to the Ephedras and Casuarinas, but this resemblance is confined to their general aspect. With ferns and club-mosses they have little in common. Their most direct relationship is with the aquatic group Chara. The Horsetails are distinguished from other plants by the following characteristics. They are leafless, branching, with hollow jointed stems, separable at certain joints, which occur at intervals where they are solid, and surrounded by membraneous toothed sheaths; each length, in fact, terminates above in one of these sheaths into which the base of the next length fits. The sheaths seem to represent abortive leaves. The fructification consists of terminal cone-like heads) In some species the deposit of silicious matter is so great, that the whole of the vegetable substance may be destroyed by maceration, the form of the plant being preserved entire in the flinty coating. It has been found that the ashes contain half their weight of silica. The jointed tubular silcious stems, and terminal cones of fructification, are marks by which the Equisitums may always be readily distinguished from all other plants.

243. Equisetum debile, Roxburgh.—Calcutta Journ. Nat. Hist. 1846, t. 26. ex Pritzel's Icon. Bot. Index, Royle's Illus. of the Bot. Him. 431. As walgā-tana, Sin (meaning Horsetail) Moon Cat. 75. 1824. I found this plant on the road side quite common, between Nuwara Eliya Plains and Hackgalla in 1859, and again in 1870. "It has been described by Dr. Roxburgh as indigenous in Bengal, and has been found in Dindygal by Wight, in Burma by Wallich. (E. pallens), and along the foot of the Himalayas from Silvet to Deyra Doon, as well as in the Northern Doab along the banks of the Jumna, though some of these vary in appearance from Dr. Roxburhh's Bengal specimens." Royle l. c. I have not seen Roxburgh's description nor figure, of this apparent outcast of its race in Ceylon, and my specimens have been much eaten by insects. It appears, however, to somewhat belie its specific name, as my specimens are erect, few branched and somewhat rigid.—To those who take an interest in the fossil plants represented by living members of the same family, this plant is of great interest and to those who like the writer delight to recognise allies of common plants of the North of Scotland amid Asia, where Europe smiles, the writer trusts that the sight of this plant by any traveller on the road from Nuwara Eliya to Hackgala will remind him of the trite expression.

"One touch of Nature makes the whole world kin."

Since writing the foregoing I have been able to consult Mr. Spring's work on the Lycopodiaceæ, and I add the following list of Lycopodiums and Selaginellas from it which are given as Ceylon ones :—

1. Lycopodium aloifolium, Wallich Cat. on the trunks of trees on the tops of mountains in India, Ceylon : Col. Walker in Hooker's Herb.
2. L. ceylaccum, Spring. Ceylon. Gardner.
3. L. verucosum, Hook. et Gr. In Ceylon Col. Walker, in Herb. Hooker.
4. L. serratum Thumb. In Ceylon Emerson, Col. Walker, Gardner, in Herb. Hooker. See No. 228.
5. L. subulifolium, Wallich. In Ceylon Walker, Gardner, in Herb, Hooker.
6. L. Hookeri, Wall. Cat. is given as a synonym of L. ulicifolium, Vent. Not given as from Ceylon. See my notes on No. 227.
7. L. squarrosum, Forst. In Ceylon, Gardner in Herb. Hooker.
8. L. Phlegmaria, Lim. See No. 226.
9. L. macrostachys, Hooker in Herb. Ceylon Walker, Wight
10. L. cernuum, Linn. See No. 231.
11. L. clavatum, Linn. See No. 229.
12. L. Carolinianum, Linn. See No. 232.
13. L. complanatum, Linn, not given from Ceylon by Mr. Spring. See No. 230.

1. Selaginella rupestris, Spring. See No. 233.
2. S. integerrmia, Spring. In Ceylon Klein, Gardner, Walker.—This is considered to be the veritable L. ornithopodioides, Linn. by H. and Gr. See my notes on No. 238, but Spring gives another species, and quotes Lyc. hispidum, Willd. as a synonym for it.
3. S cochleata, Spring. In Ceylon, Leschenault, in the Herb. Mus. Paris.
4. S. atroviridis, Spring—S. monospora, Spring. Not given as a Ceylon plant. See No. 237.
5. S. caudata, Spring, who quotes Lyc. canaliculatum, Linn. as a synonym. See No. 235, and my notes after No. 238.
6. S. caubscens, Spring See No. 236.
7. S. latifolia, Spring, Adam's Peak, Emerson, Walker in Herb. Hooker.
8. S. concinnæ, Spring. See No. 238.
9. S. stolonifera, Spring, Ceylon not given for it. See No. 234.
10. S. ciliaris, Spring, Ceylon Koening, Macrae. See my note on this plant after No. 238.
11. S. tenera, Spring, Ceylon, Walker, Gardner.
12. S. Belangeri, Spring. Ceylon, Gardner.
13. S. crassipes, Spring. Ceylon, Walker.
14. S. brachistachya, Spring. Ceylon, Gardner, Walker. (A variety with serrulate.—denticulate leaves is given in reference to Walker's specimen.) See my concluding remarks on this species after No. 238.

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